

***FINAL YEAR PROJECT
SYMPOSIUM***

2017/2018

23 May 2018 (Wednesday)

24 May 2018 (Thursday)

27 May 2018 (Sunday)

**Presentation Schedule
23 May 2018 (Wednesday)**

Mathematics Computer Lab 1

9.00. – 9.20 am	Name: Nurul Afiqah Hassan SV: PM Dr. Rohanin Ahmad E : Dr. Rashidah Ahmad (C) E : Dr. Zaitul Marlizawati Zainuddin
9.25 – 9.45 am	Name : Nor Atikaf Binti Rashid SV: Dr. Syarifah Zyurina Nordin/ Dr Nur Arina Bazilah Aziz E : Dr. Zaitul Marlizawati Zainuddin E : Dr. Rashidah Ahmad (C)
9.50 –10.10 am	Name: Nur Atiqah Binti Amral SV : Dr. Farhana Johar E : Dr. Nur Arina Bazilah Aziz E : Dr. Rashidah Ahmad (C)
10.15 – 10.35 am	Name : Wong Sing Wei SV : Dr. Rashidah Ahmad E : Dr. Zaitul Marlizawati Zainuddin(C) E : PM. Dr. Ali Hassan Mohd Murid
BREAK	
10.50 – 11.10 am	Name : Nur Atika Binti Masbah SV: Dr. Syarifah Zyurina Nordin/ Dr Rashidah Ahmad E : En. Ismail Kamis (C) E : En.Wan Rohaizad Bin Wan Ibrahim
11.15 – 11.35 am	Name: Anis Qistina Binti Md Nazari SV : Dr. Nur Arina Bazilah Aziz E: En. Ismail Kamis (C) E : En Muhamad Najib Zakaria
11.40 – 12.00 pm	Name: Siti Hajar Mazlan SV: En Wan Rohaizad Wan Ibrahim E : En. Ismail Kamis (C) E : Dr. Nur Arina Bazilah Aziz
12.05 – 12.25 pm	Name : Nuraliah Binti Zamberi Penyelia : Dr. Farhana Johar E : Dr. Nur Arina Bazilah Aziz (C) E : PM Dr Nor Muhainiah Mohd Ali
BREAK	
2.30 – 2.50 pm	Name: Marina Syazlin Binti Mohd Saidi SV : PM Dr Khairil Anuar Arshad E : Dr. Mohd Ariff Admon (C) E : PM Dr Ong Chee Tiong
2.55 – 3.15 pm	Name: Aina Izzati Binti Mohd Esa SV : PM Dr. Munira Ismail E : Pn Halijah Osman (C) E: PM Dr Ong Chee Tiong
3.20 – 3.40 pm	Name: Mohamad Izzat Bin Mohamad Fadzil SV : PM Dr. Normah Maan E : Dr. Fuaada Mohd Siam E: Pn Halijah Osman (C)

Note: SV – Supervisor, E – Examiner, C – Chairperson

Mathematics Computer Lab II

9.00. – 9.20 am	Name: Nur Fatin Kamila Binti Zanalabidin SV: PM. Dr. Mukhidin Muminov E : PM. Dr. Ali Hassan Mohd Murid E : Dr. Niki Anis Abd Karim (C)
9.25 – 9.45 am	Name: Azlin Nor Izzati Binti Abdul Rahman SV : Prof. Dr. Tahir Ahmad E : Dr. Niki Anis Abd Karim (C) E : PM. Dr. Ali Hassan Mohd Murid
9.50 – 10.10 am	Name: Nur Syahirah Binti Mohd Salehuddin SV : Prof. Dr. Tahir Ahmad E : Dr. Niki Anis Abd Karim (C) E : PM Dr. Nor Muhainiah Mohd Ali
10.15 – 10.35 am	Name : Sharmilly A/P Thurai Raja SV: Prof. Dr. Norhaniza Sarmin E : PM Dr. Nor Muhainiah Mohd Ali (C) E : PM. Dr. Nor'aini Aris
BREAK	
10.50 – 11.10 am	Name : Siti Hawa Binti Mohamad Tawil SV : Dr. Fong Wan Heng E : Prof Dr Norhaniza Sarmin E : Dr. Amidora Idris (C)
11.15 – 11.35 am	Name : Nur Fatin Azma Binti Rasidi SV : Dr. Amidora Idris E : PM. Dr. Mukhidin Muminov (C) E : Prof Dr Norhaniza Sarmin
11.40 – 12.00 pm	Name: Nurul Syafiqah Binti Ab Wahab SV : Dr. Amidora Idris E : PM. Dr. Mukhidin Muminov (C) E : Prof. Dr. Tahir Ahmad
12.05 – 12.25 pm	Name : Nur Arisha Binti Mohd Azhar SV : Dr. Niki Anis Abd Karim E : Prof. Dr. Tahir Ahmad E: Dr. Amidora Idris (C)
BREAK	
2.30 – 2.50 pm	Name : Selly Septy Nurmy Binti Mohd Yatim SV: Dr. Nor Muhainiah Mohd Ali E : Dr. Fong Wan Heng (C) E: Dr. Hazzirah Izzati Mat Hassim
2.55 – 3.15 pm	Name : Rosnita Binti Abdul Shukur SV : Dr. Nor Muhainiah Mohd Ali E : Dr. Fong Wan Heng (C) E: Dr. Hazzirah Izzati Mat Hassim
3.20 – 3.40 pm	Name : Fatin Lina Amira Binti Mohd Idris @ Yes SV : En. Che Lokman Jaafar E : PM. Dr. Nor'aini Aris E : Dr. Taufiq Khairi Ahmad Khairuddin (C)
3.45 – 4.05 pm	Name : Nuralisa Shazlin Binti Mohd Hassan SV : En. Che Lokman Jaafar E : Dr. Taufiq Khairi Ahmad Khairuddin (C) E : Dr. Fong Wan Heng

Note: SV – Supervisor, E – Examiner, C – Chairperson

Mathematics Computer Lab III

9.00. – 9.20 am	Name : Nurainaa binti Rushdan SV : Dr. Norhaiza Ahmad E : Dr. Ani Shabri (C) E : Pn Noraslinda Mohd Ismail
9.25 – 9.45 am	Name: Ahmad Amirul Amin Bin Othman SV: Prof. Dr. Zuhaimy Ismail E: Dr. Ani Shabri (C) E: Dr. Hang See Pheng
9.50 – 10.10 am	Name: Siti Zulaikha Binti Zulkefli SV: Dr. Haliza Abd Rahman E: Pn Noraslinda Mohd Ismail (C) E: Dr. Hang See Pheng
10.15 – 10.35 am	Name: Dolyne Napi SV: Dr. Haliza Abd Rahman E: Pn Noraslinda Mohd Ismail (C) E: Dr. Amidora Idris
BREAK	
10.50 – 11.10 am	Name: Normas Murni Binti Ali SV: Dr. Shariffah Suhaila Syed Jamaluddin E: Dr. Norazlina Ismail (C) E: Dr. Ani Shabri
11.15 – 11.35 am	Name: Nurul Shuhada Binti Mohamad SV: Dr. Shariffah Suhaila Syed Jamaluddin E: Dr. Norazlina Ismail (C) E: Prof. Dr. Zuhaimy Ismail
11.40 – 12.00 pm	Name: Nurul Ain Binti Mohd Azli SV: Dr. Ani Shabri E: Prof. Dr. Zuhaimy Ismail E: Dr. Norazlina Ismail (C)
12.05 – 12.25 pm	Name: Nurul Alyaa' Binti Norazam SV: Wan Rohaizad Wan Ibrahim E: Prof. Dr. Zuhaimy Ismail E: Dr Zaiton Mat Isa (C)
BREAK	
2.30 – 2.50 pm	Name: Nur Idayu Binti Masani SV: Dr. Norazlina Ismail E: PM Dr. Fadhilah Yusof E: Dr Hang See Pheng (C)
2.55 – 3.15 pm	Name: Nur Zaira Syakirah Binti Mohd Zaidi SV: Zarina Mohd Khalid E: PM Dr. Fadhilah Yusof E: Dr. Arifah Bahar (C)
3.20 – 3.40 pm	Name: Nurul Atiqah Binti Mohd Razali SV: Dr. Muhammad Fauzee Hamdan E: Dr. Arifah Bahar (C) E : Dr. Mohd Ariff Admon
3.45 – 4.05 pm	Name: Reenusha A/P Pakianathan SV: Dr. Muhammad Fauzee Hamdan E: Dr. Arifah Bahar (C) E: Dr. Faridah Mustapha

Note: SV – Supervisor, E – Examiner, C - Chairperson

Main Meeting Room

9.00. – 9.20 am	Name : Nur Fariha Binti Bharun SV : En Che Rahim Che Teh E : En. Che Lokman Jaafar E : Dr Zuhaila Ismail (C)
9.25 – 9.45 am	Name: Nornabila Najwa Binti Zuhairi SV: Prof. Dr. Norsarahaida S Amin E: Dr. Zuhaila Ismail (C) E: PM Dr Norma Alias
9.50 – 10.10 am	Name: Fatin Fazlina Binti Nasrun SV : Prof Dr. Zainal Abd Aziz E : PM. Dr. Norma Alias (C) E : PM. Dr. Nor'aini Aris
10.15 – 10.35 am	Name : Nur Syarmila Bint Romainor SV : Dr. Shazirawati Mohd Puzi E: En. Hamisan Rahmat E : PM Dr Norma Alias (C)
BREAK	
10.50 – 11.10 am	Name: Ahmad Syahdansyah Bin Ruzain SV: Pn Halijah Osman E : Dr Maslan Osman E : PM Dr Yudariah Yusof (C)
11.15 – 11.35 am	Name: Nur Syahirah Binti Sahril SV: PM Dr. Ali Hassan Mohamed Murid E : PM Dr Yudariah Yusof (C) E : Dr Maslan Osman
11.40 – 12.00 pm	Name: Nuratiqah Binti Samat SV: PM Dr. Ong Chee Tiong E: PM Dr Yudariah Yusof (C) E: Dr Maslan Osman
12.05 – 12.25 pm	Name: Noor Shafiqah Binti Rahman SV: PM Dr. Ong Chee Tiong E: En Ibrahim Mohd Jais E: En Muhammad Najib Zakaria (C)
BREAK	
2.30 – 2.50 pm	Name: Nurhashimah Binti Bahri SV : Dr Faridah Mustapha E : Dr Anati Ali (C) E : Pn Halijah Osman
2.55 – 3.15 pm	Name : Nur Adlin Lina Binti Normisyidi SV : Dr. Yeak Su Hoe E : En. Hamisan Rahmat E : En. Che Rahim Che Teh (C)
3.20 – 3.40 pm	Nur Azira Jasman Dr Yeak Su Hoe E : En Che Rahim Che Teh (C) E: En Hamisan Rahmat
3.45 – 4.05 pm	Pelajar : Muhammad Khairuddin Bin Zahuri Penyelia : En. Hamisan Rahmat E : En Che Rahim Che Teh (C) E : Dr. Mohd Ariff Admon

Note: SV – Supervisor, E – Examiner, C - Chairperson

**Presentation Schedule
24 May 2018 (Thursday)**

Mathematics Computer Lab 1

9.00. – 9.20 am	Name : Izyan Hanis Binti Jamil SV : En. Ismail Kamis E : Dr. Farhana Johar (C) E : Dr Zaiton Mat Isa
9.25 – 9.45 am	Name: Muhamad Shafiq Idzham Bin Abdullah SV: PM Dr. Rohanin Ahmad E: Dr. Farhana Johar (C) E: En.Wan Rohaizad Bin Wan Ibrahim
9.50 – 10.10 am	Name : Mohd Zulhilmi Bin Rosli SV : Dr Anati Ali E : En.Wan Rohaizad Bin Wan Ibrahim E : PM Dr Rohanin Ahmad (C)
10.15 – 10.35 am	Name: Umi Haryanti binti Mohd Hisham SV : Dr Zaitul Marlizawati Zainuddin E : PM Dr Rohanin Ahmad (C) E : PM Dr. Munira Ismail
BREAK	
10.50 – 11.10 am	Name : Nur Aqilah Binti Rozaini SV : Dr Norazlina Ismail E: Dr. Shariffah Suhaila Syed Jamaluddin (C) E: PM Dr. Sharidan Shafie
11.15 – 11.35 am	Name : Nur Safirah bt Bahuriddin SV : PM Dr Fadhilah Yusof E : Dr. Shariffah Suhaila Syed Jamaluddin (C) E: Dr. Hazzirah Izzati Mat Hassim
11.40 – 12.00 pm	Name : Farah Syahirah Binti Mior Othman SV : Dr Norhaiza Ahmad E: Dr. Shariffah Suhaila Syed Jamaluddin (C) E: Dr Ani Shabri

Note: SV – Supervisor, E – Examiner, C - Chairperson

Mathematics Computer Lab II

9.00. – 9.20 am	Name: Alia Rafiza Binti Che Ayob SV: Dr Zuhaila Ismail E: Prof. Dr. Norsarahaida S Amin E: Dr. Faridah Mustapha (C)
9.25 – 9.45 am	Name: Nur Amirah Binti Bakri SV : Dr. Anati Ali E : Dr. Faridah Mustapha (C) E: Dr Zuhaila Ismail
9.50 – 10.10 am	Name: Fathin Binti Azman SV : En Ibrahim Mohd Jais E : Dr. Zaiton Mat Isa E : Dr. Fuaada Mohd Siam (C)
10.15 – 10.35 am	Name: Siti Nur Fadila Binti Azmi SV : En. Ibrahim Mohd Jais E : Dr. Zaiton Mat Isa E : Dr. Fuaada Mohd Siam (C)
BREAK	
10.50 – 11.10 am	Name: Nor Syazmin Binti Ramli SV : Dr. Fuaada Mohd Siam E : PM Dr. Normah Maan E : Pn Wan Rukaida Wan Abdullah (C)
11.15 – 11.35 am	Name: Muhammad Faiz Bin Muhammad Zaini SV :PM Dr. Sharidan Shafie E : Pn Wan Rukaida Wan Abdullah (C) E : PM Dr. Normah Maan
11.40 – 12.00 pm	Name: Muhammad Fakrullah Amni Bin Mohd Khairil Hisham SV : Pn Wan Rukaida Wan Abdullah E :PM Dr. Sharidan Shafie E : En. Muhamad Najib Zakaria (C)
12.05 – 12.25 pm	Name: Azrin Sharmin Binti Nor Ishak SV : Pn Wan Rukaida Wan Abdullah E : PM Dr. Sharidan Shafie E : En. Muhamad Najib Zakaria (C)

Note: SV – Supervisor, E – Examiner, C - Chairperson

Mathematics Computer Lab III

9.00. – 9.20 am	Name : Amirah Binti Abdul Karim SV : Dr Arifah Bahar, E : Dr Muhammad Fauzee Hamdan (C) E : Dr Zarina Mohd Khalid
9.25 – 9.45 am	Name : Muhammad Nazrul Izwan Bin Muhamad Nashirruddin SV : PM Dr Fadhilah Yusof E : Dr Muhammad Fauzee Hamdan (C) E : Dr Zarina Mohd Khalid
9.50 –10.10 am	Name: Azira Hani Binti Muharam SV : Pn Noraslinda Mohd Ismail E : Dr Haliza Abd Rahman (C) E : Dr Muhammad Fauzee Hamdan
10.15 – 10.35 am	Name: Nur Amalina Binti Ahmad Fuzi SV : Pn Noraslinda Mohd Ismail E : Dr Haliza Abd Rahman (C) E : Dr Zarina Mohd Khalid
BREAK	
10.50 – 11.10 am	Name: Nur Zulaika Binti Zainalabidin SV : Dr Zarina Mohd Khalid E : PM Dr Ismail Mohamad E : Dr Haliza Abd Rahman (C)
11.15 – 11.35 am	Name : Sakthiswran a/l Arumugam SV : Prof Dr Zuhaimy Ismail E : PM Dr Ismail Mohamad E : Dr Norhaiza Ahmad (C)
11.40 – 12.00 pm	Name: Nur Ezzati Binti Abdul Manap SV : PM Dr Ismail Mohamad E : Dr Norhaiza Ahmad (C) E: Dr Hang See Pheng
12.05 – 12.25 pm	Name: Nur Syaza Aqilah bt Zaini SV : Dr Arifah Bahar, E : Dr Norhaiza Ahmad (C) E : PM Dr Ismail Mohamad

Note: SV – Supervisor, E – Examiner, C - Chairperson

Main Meeting Room

9.00. – 9.20 am	Name: Nur Amelene Aqilah Binti Mohd Nor SV : Dr. Fuaada Mohd Siam E : Dr. Taufiq Ahmad Khairuddin E : PM Dr. Munira Ismail (C)
9.25 – 9.45 am	Name: Syarifah Nur Ain Binti Syd Badaruddin SV : Dr. Zaiton Mat Isa E : PM Dr. Munira Ismail (C) E : PM Dr. Khairil Anuar Arshad
9.50 – 10.10 am	Name: Nur Syafiqah Binti Husin SV : Dr. Mohd Ariff Admon E : PM Dr. Khairil Anuar Arshad (C) E : Dr. Anati Ali
10.15 – 10.35 am	Name: Nor Fitrah Binti Ramlan SV : Dr. Taufiq Khairi Ahmad Khairuddin E : PM Dr. Ong Chee Tiong E : PM Dr. Khairil Anuar Arshad (C)
BREAK	
10.50 – 11.10 am	Name : Ain Shafika Binti Rosli Name : PM Dr. Khairil Anuar Arshad E : Dr. Shazirawati Mohd Puzi (C) E : Dr Yeak Su Hoe
11.15 – 11.35 am	Name: Nur Alia Fatihah Binti Laililnizan SV: Prof Dr. Mohd Nor Mohamad E : Dr. Shazirawati Mohd Puzi (C) E : Dr. Yeak Su Hoe
11.40 – 12.00 pm	Name: Syuhadah Binti Abdullah SV : PM. Dr. Munira Ismail E : Dr. Yeak Su Hoe E : Dr. Shazirawati Mohd Puzi (C)
12.05 – 12.25 pm	Name: Angela Odong SV : Pn Halijah Osman E : Dr. Hazzirah Izzati Mat Hassim (C) E : Prof Dr Mohd Nor Mohamad

Note: SV – Supervisor, E – Examiner, C - Chairperson

**Presentation Schedule
27 May 2018 (Sunday)**

Venue: Main Meeting Room (C22-Level 3)

Time	Details
9.00 – 9.20 am	Name: Nur Syahirah Binti Abdul Aziz SV : PM Dr Norma Alias E : En Ibrahim Mohd Jais E : En Che Lokman Jaafar
9.25 – 9.45 am	Name: Choy Bei Yee SV : Dr Mohd Ariff Admon E : En Che Lokman Jaafar E : En Ibrahim Mohd Jais
9.50 – 10.10 am	Name: Nur Sabariah binti Ajis SV : Dr Faridah Mustapha E : PM Dr Normah Maan E : Dr Anati Ali
10.15 – 10.35 am	Name: Nik Fazera binti Nik Azeman SV : Dr Zaitul Marlizawati Zainuddin E : PM Dr Rohanin Ahmad E : Dr Farhana Johar

Chairperson: JK PSM

Forecasting Tourism Arrival Using Holt-Winters Exponential Smoothing

Ahmad Amirul Amin Bin Othman & Prof. Dr. Zuhaimy Ismail

Malaysia is ranked 9th in the world for tourist arrival based on The Travel and Tourism Competitiveness Report 2017. Tourism demand forecast play a crucial role in the tourism industry. Forecasting of this industry will allows marketers and any other managers in reducing the risk of decision making and the cost of serving the travelling public. In this research, monthly data of tourist arrival into Malaysia from January 2007 until August 2017 is used. The data is collected from www.mytourism.gov.my. The data is being analyzed using Matlab and the calculation is done in Microsoft Excel 2013. The study will focus on Holt-Winters Additive Method and Holt-Winters Multiplicative Method. In addition, Simple Moving Average (SMA) is likewise used in this forecasting process. Based on the overview of the observed period, the forecasting of tourism arrival for the period from January 2017 until August 2017 is carried out. To measure the accuracy, a statistical measurement Mean Absolute Percentage Error (MAPE) is used. The MAPE values obtained for SMA, Holt-Winters Multiplicative and Holt-Winters Additive is 5.093662, 3.721041 and 7.842806. Therefore, the Holt-Winters Multiplicative method is more accurate in forecasting monthly tourist arrival.

Elzaki Transform Method For Ordinary Differential Equations

Ahmad Syahdansyah Bin Ruzain & Pn Halijah Bte Osman

This study is about Elzaki method in solving ordinary differential equations. Elzaki transform is a convenient tool as integral transform method to solve differential equations based on its fundamental properties. In this study, we apply this method to linear shock damper problem involving linear equation. The general solution obtained based on fundamental properties and inverse of Elzaki transform. This method also applied to tuned mass damper system which is linear system contains homogeneous and nonhomogeneous equations, and we obtained the results as general solution of the system equations. This finding shows that Elzaki transform method is efficient tool in solving differential equations problem.

The Application of Neural Network in Determining the Production of Spinach

Ain Shafika binti Rosli & PM Dr. Khairil Anuar Arshad

Artificial Neural Network (ANN) is one of the mathematical method used to predict data. This method has been widely used in many areas such as banking system, stock market and medication. The purpose of this research is to predict the production of spinach based on the data collected from the Department of Chemistry in the Faculty of Science. Using neural network, the fertilisers are being modelled. A total of 49 data was used in this research where 70% of the data was used as the training data while 15% each was used for testing data and validating data. The problem was divided into three cases, each with different number of variables. According to the steps in solving neural network, the cases were trained by using STATISTICA 10 software. The cases were trained to observe the least mean square error (MSE) produced by each of the cases. The results for this research show that Case 2 with variables such as NPK, urine, compost, height of stem and circumference of stem gives the lowest MSE value. This concludes that Case 2 gives the best prediction value as compared to the other two cases. With the result obtained, this could help the cultivators to model their own crops using suitable variables in order to predict their crop yield.

Analytic Solution Of Heat Equation Using Adomian Decomposition Method

Aina Izzati Binti Mohd Esa & Assoc. Prof. Dr. Hjh. Munira Binti Ismail

The method of separation of variables is well known to solve partial differential equation for its exact solution. However, separation of variables is limited to solve linear homogeneous equation only. Thus, this project explore in detail the Adomian decomposition method. Since the advantage of Adomian decomposition method is that it can solve any linear and nonlinear partial differential equation to get an approximate analytic solution. In addition, the procedures in applying both methods separation of variables and Adomian decomposition method are illustrated in some special cases for the linear heat equation and Adomian decomposition method for the nonlinear heat equation cases. Further, an application problem involving an extended surface for variable thermal conductivity is considered to find the approximate analytic solution for temperature distribution by using Adomian decomposition method.

Numerical Simulation of Biomagnetic Fluid Flow in Bifurcated Artery with Mild Stenosis

Alia Rafiza Binti Che Ayob & Dr Zuhaila Haji Ismail

This study presents the numerical simulation of the biomagnetic fluid flow in bifurcated artery with mild stenosis under the influence of a spatially varying magnetic field. The mathematical model of biomagnetic fluid dynamic which is used for the formulation of the problem is consistent with the principles of ferrohydrodynamics and magnetohydrodynamics. This study focuses on the blood flow characteristics such as velocity, streamlines and pressure in bifurcated artery with mild stenosis under the presence of applied magnetic field. Biomagnetic fluid (blood) flow is considered two dimensional, steady, laminar, incompressible and electrically conducting Newtonian magnetic fluid. The governing equations of the biomagnetic fluid dynamic is acquired by the derivation of continuity and momentum equations which is based on fundamental physical principles using fixed finite control volume model. The solution of the biomagnetic fluid dynamic problem is obtained numerically using COMSOL Multiphysics 5.2 simulation software that based on finite element method. Blood flow characteristics due to the effect of biomagnetic fluid dynamic through bifurcated artery with mild stenosis will be determined. This study may help better understanding behaviour of blood flow in bifurcated artery with mild stenosis in the presence of applied magnetic field, and how the characteristics (velocity, streamlines and pressure) are changed under these conditions.

Factorial Design And Prediction Of Mild Steel Corrosion Rate In Seawater

Angela Odong & Puan Halijah Osman

This study was carried to predict corrosion rate of mild steel in seawater. Statistica is the software mainly used in this research and using Origin to produce graph. The research consists of two method, that is 2-level screening design (Plackett-Burman) a kind of factorial design and then using neural network functions in Statistica. The first method which is the factorial design is used to determine in prior of experiment the most influential or strongest factor amongst the 5 factors (chlorine concentration, pH, SO₄ concentration, temperature and dissolved oxygen concentration), while using neural network as the corrosion predictor.

Laser Induce Breakdown Spectroscopy By Using Principal Component Analysis For Metal Of Copper

Amirah binti Abdul Karim & Dr. Arifah Bahar

Laser induced Breakdown Spectroscopy (LIBS) is an analytical technique used for the identification of elements by analyzing the emission line spectrum from samples. In this research, the detection element of the sample based on emission spectra by using laser induced breakdown spectroscopy (LIBS) and to reduce the noise in the spectral data by using Principal component analysis (PCA). An experimental setup was developed using a Q-Switched Nd:YAG laser (Tattoo Removal Laser System, GSD-903) which can deliver energy in the range of 200 mJ with a pulse duration of 8 ns at a wavelength of 1064 nm and a spectrometer connected to a fiber optic in order to collect the atomic emission. One plate of metal was prepared as the sample. The LIBS experiment was able to detect the elements in the metal sample which is copper. The raw spectra data were preprocessed and grouped into datasets for analyzing in the PCA. Two parameter was used in this research which were voltage of the LIBS and distance between the focal lens and sample. For each parameter we take 3 variable as the datasets. The experimental results show that the weighted PCA method can effectively improve the accuracy and precision of the spectral data.

Optimal Product Mix For Organic Baby Food Production

Anis Qistina Binti Md Nazari & Dr. Nur Arina Bazilah Aziz

Product mix problems are a typical application of Linear Programming. They include mixing of several resources or materials to create one or more products corresponding to a demand. Linear Programming is concerned with the optimization of a linear function whereas fulfilling a set of linear equality and inequality constraints and restrictions. It has been utilized in numerous industrial areas like banking, bakery, horticulture and many more in order to solve optimization problem. Therefore, the main purpose of this study is to formulate the model in order to obtain maximum profit. This study also focuses on the sensitivity analysis due to change of profit and the cost of each ingredient. The optimum result is obtained from LINDO which is RM 40.40 per mix.

Cox Regression Analysis on the Patients of Severe Aplastic Anemia that Undergo Bone Marrow Transplant Data

Azira Hani Binti Muharam & Pn. Noraslinda Mohd Ismail

Survival analysis is the analysis of time to event data. These data describe the length of time from time origin to an endpoint of interest. This study considers the censoring of an unknown time of survival of the patients Severe Aplastic Anemia (SAA) that undergo bone marrow transplant. This research purpose is to identify the covariates that effect the time to severe Acute Graft versus Host Disease (AGvHD) of different on the patients. The parameter estimation is based on Cox regression model and Bayesian Approach via R Software and OpenBUGS. Cox's model has become extremely popular, especially in medical statistics. A key reason for the probabilities of Cox's model is that, even though the baseline hazard is not specified, reasonably good estimates of regression coefficients, hazard ratio of interest, and adjusted survival curves can be obtained for wide variety data situations. At the end of the study, the result shows that the combination of two type of treatment condition increases the survival times of the patients. Thus, in the future, that treatment can improvise in the industry of medical.

The Visualization Of Fuzzy Detour Of Fuzzy Graph Type-3 Of An Incineration Process

Azlin Nor Izzati Binti Abdul & Prof Dr.Tahir Ahmad

Clinical waste can become a serious health hazard to the people surrounding if it is not disposed with proper steps and follow the international regulations. Hence, the possible process to eliminate those clinical wastes is by incineration. So, Fuzzy Autocatalytic Sets (FACS) of fuzzy graph Type-3 (FT3) is use to model the incineration process of the clinical waste. In this research, the mathematical programming is used to visualize the concept of fuzzy detour FT3-distance in FACS which is the FT3-length of a path between vertices in FACS and the maximum FT3-length of a path. In other words, the research is done to visualize the longest path taken of the graph of incineration process using the concept of fuzzy detour FT3-distance. Therefore, the FT3-length of a path in FACS is being investigated and calculated. Then, the maximum FT3-length is taken as fuzzy detour FT3-distance. Next, the programming software will be used to visualize the path of that fuzzy detour FT3-distance to be more understandable.

Mixed Convection Boundary Layer Flow of Viscoelastic Fluids Past A Sphere With Constant Wall Temperature

Azrin Sharmin binti Nor Ishak & Puan Wan Rukaida binti Wan Abdullah

The mixed convection boundary layer of a viscoelastic fluid past a sphere with constant temperature is discussed. The boundary layer equations are an order higher than those for the Newtonian (viscous) fluid and the adherence boundary conditions are insufficient to determine the solution of these equations completely. The governing non-similar partial differential equations are first transformed into dimensionless forms and then solved numerically using the Keller-box method by augmenting an extra boundary condition at infinity. Numerical results are presented for different values of the viscoelastic and mixed convection parameters K and λ , respectively. It is found that for cases of cooling sphere ($\lambda < 0$) and heating sphere ($\lambda > 0$), the boundary layer separates from the sphere. To the best of our knowledge, this important classical problem has not been studied before for the case of a viscoelastic fluid.

Integral Equation of Stefan Problem Due to Melting Process

Choy Bei Yee & Dr Mohd Ariff bin Admon

Moving boundary problem is a kind of boundary value problem and solving for unknown domain of the boundary. Such example of this problem is Stefan problem for ice melting process where the interface between the solid and liquid phase is the moving boundary during the phase change. Stefan problem requires the solution of moving interface as a function of time along with the change in temperature distribution. Determination of the solution is subject to initial condition, boundary conditions and Stefan condition. Thus, this study considered for one dimensional Stefan problem of ice melting process with the aim of finding an integral equation representation of Stefan problem. Fundamental solution of heat equation is first evaluated using similarity transformation technique to obtain heat kernel and Green function. With the aid of Green function and an auxiliary proposition, Stefan problem is reduced to a problem of finding a unique solution of a nonlinear integral equation.

Evaluation of Calibration of Optical Emission Spectrometry Machine Based on Linearity

Dolyne Napi & Dr Haliza binti Abd Rahman

Calibration is a necessary process that need to be done for a machine in order to maintain their accurate performance over time. Calibration can be defined as an association between measurements – one of a scale or accuracy made or set with one piece of equipment and another measurement made in as similar a way as possible with a second piece of equipment. In this study, the focus is on the application of Optical Emission Spectrometry in a machine. Optical Emission Spectrometry, or OES, is a well trusted and widely used analytical technique used to determine the elemental composition of a broad range of metals. Specifically, this study is focusing on calibration of RA-10 sample for OES machine, based on linearity. Once the calibration function is established, their linearity can be confirmed by using different procedures such as graphical plots, statistical significance tests and numerical parameters. Forward Regression approach is applied to obtain the predicted value of concentration of element (y_i) for each week of calibration. With Relative Standard Deviation (RSD) value as the main factor in determining the completion of a calibration process, RSD of 10.0 value and below need to be obtained for each element as a specified standard RSD for RA-10 sample. While in Inverse Regression approach, the future unknown number of iterations of sparks (x_i) values will be estimated by applying the inverse solution to the observed concentration value (y_i)'s. In conclusion, applying linear regression do helps a lot in improving a calibration of OES machine.

Johor River Discharge Forecasting during Linggiu Reservoir Construction Period

Farah Syahirah binti Mior Othman & Dr. Norhaiza binti Ahmad

Abstract Accurate forecast of the river discharge has a notable significance in water resources management. In this study, two time series models, Support Vector Regression (SVR) and Autoregressive Integrated Moving Average (ARIMA) models were used to forecast Johor River discharge. Linggiu Reservoir construction from November 1990 until April 1993 are known to alter the equilibrium of Johor River. Hence, the identification of a more suitable model to forecast Johor River discharge during the construction period is crucial to get accurate predictions. In this study, daily discharge data of Johor River and Sayong River from years 1987 to 1995 were used. The statistics regarding to the first 70% of the data (March 1987 up to December 1992) were used for training and the last 30% of the data (January 1993 up to June 1995) were used for validation. The forecast precision of both time series models was assessed by comparing their Root Mean Squared Error (RMSE). Based on the results, SVR model with RMSE obtained 28.54524 performs better than ARIMA model with RMSE obtained 34.1647 in forecasting Johor River discharge during Linggiu Reservoir Construction period.

Rayleigh Benard Convection on Modulated Heating Excitation of Conducting Walls

Fathin binti Azman & Ibrahim bin Mohd Jais

Abstract Convection can be described as an equilibrium process due to temperature variation in porous media. Horton and Rogers (1945) and Lapwood (1948) were the early researchers that studied about thermal convection in a fluid saturated porous layer heated from below. We concentrate our study on numerical solution of the Darcy problem in rectangular cavity as boundary forcing. We set the lower boundary to have a temperature of $\cos\pi x * \cos n\pi x$ when n is taken to be odd numbers, where we have the structure to be symmetrical to $x = \frac{\pi}{4}$ and the temperature is allowed to travel to the top by this equation $\frac{\partial^2 \varphi}{\partial x^2} + \frac{\partial^2 \varphi}{\partial y^2} = Ra \frac{\partial \theta}{\partial x}$. We know that the onset of the convection is at $Ra = 4\pi^2$ by Busse ballons. As the Ra increases greater than 80, the convection cells multiply to two set of convection cells or four convection cells. We changed the amplitude $\varepsilon = 0.1, \varepsilon = 0.2, \varepsilon = 0.3, \varepsilon = 0.4, \varepsilon = 0.5$ and $T=3, T=5, T=7, T=9$ to observe the modeling of the structure whether it is breaks into one set to two set or two set to three sets of convection cells.

Application of PDE in Economic Welfare

Fatin Fazlina Binti Nasrun & Prof. Dr. Zainal Abd Aziz

After the GST was launched on April 1, 2015, most Malaysians have expressed a sense of grievance as it has slightly burdened those with low incomes. According to Household Expenditure Survey Report. (2017), 2016-2017 showed Malaysia's average monthly household consumption expenditure rose from RM3, 578 in 2014 to RM4, 033 in 2016, a growth of 6.0 per cent per annum in nominal value. While at the true value, the annual growth rate is 3.9 percent for the same period. Average monthly household consumption expenditure in the city is increasing at 5.8 per cent per annum from RM3, 921 to RM4, 402 while in rural areas also increased at 5.7 per cent per annum from RM2, 431 to RM2, 725 for 2014 to 2016 (Department Statistics Malaysia 2017). This has shown that once the GST is implemented, the increase in household spending has increased mainly housing, water, electricity, gas & other fuels. In order to calculate the GST roughly, we will develop the mathematical formulation of Vartia approximation which consists of Indirect Utility Function and Hicksian demand function which consists of derivation of compensated income, compensated demand and conditions for movements on the same indifference surface and how to move on the same indifference surface. Then, the Vartia method is solved by using Excel software so as to make it easy and to ensure that the calculation is correct. We derive and apply the Indirect Utility Function impact is derived and applied to the social welfare by using Roy's Identity while using Vartia method. This shows that our objective is achieved. As a conclusion, we can find out the economic price index using the Vartia method. When supply goes up, demand will also increase and definitely the government will be able to profit a lot.

Summing Up Infinite Series Using Residue Theorem

Fatin Lina Amira binti Mohd Idris @ Yes & En. Che Lokman Jaafar

Residue Theorem is a wonderful application that can solve the infinite series problem. Since a lot of people from other field used infinite series in their work directly or indirectly so it is important to have good understanding of a infinite series. The purpose of this research to investigate the sum of infinite series by obtaining the formula from the Residue Theorem of the form $\sum \frac{1}{n^2+pn+k}$, where p and k are constant and generalize it to more general series. The method in general will be proved and applied to the series $\sum \frac{1}{n^2+pn+k}$. Before that, the basic properties of Residue Theorem were studied to understand the method used in solving the problems. In addition, several methods which are usually used in solving infinite series such as Geometric series, Telescoping series, Taylor series, Fourier series and others method were also discussed in brief.

The Generalized Inverse And Its Application In Network Flow

Izyan Hanisbinti Jamil and Haji Ismail bin Kamis

Linear programming problem is an important branch in operational research that concerns on to get optimal solution such as for maximizing profit or minimizing cost commonly used in the corporate world. The main objective of this study is to introducing the generalized inverse and its theorems. Besides, this studies also presenting an application of the generalized inverse, which is transportation system in the electrical network flow. In order to solve that problem, method of computing the generalized inverse, Singular Value Decomposition (SVD) and improved Moore-Penrose inverse are used and its efficiency will be compare. Yet, found that the improved Moore-Penrose inverse is said to be simpler compare to Singular Value Decomposition (SVD).

Modelling of Artificial Neural Network in Efficiency of Gas Compressor

Marina Syazlin bt Mohd Saidi & Pof. Madya. Dr Khairil Anuar b Arshad

This study is conducted to model the artificial neural network (ANN). ANN is a powerful method for forecasting that has led to a tremendous surge in research activities in the past decade. ANN is highly used by researchers to solve industrial problems and has led to this study. In this study, the value of efficiency of a gas compressor is predicted based on the actual values of outputs and inputs such as suction temperature, suction pressure, discharge temperature and discharge pressure. The efficiency of a gas compressor is crucial in determining whether the gas compressor works efficiently or inefficiently as well as it can determine which variables are more influential in obtaining desired outputs. The mathematical model of ANN is modelled by a software named STATISTICA 12. The number of neurons in the hidden layer and weights for each neuron are analysed for obtain the best value of prediction with lower error. The results shows that ANN is a good method in determining the prediction

Mathematical Modelling Of Dynamics In Tumor Immune System

Mohamad Izzat bin Mohamad Fadzil & PM Dr. Normah Maan

Theoretically, mathematical models can be developed by having immune-mathematical theories which are suitable to support the advancement of theoretical immunology. In this paper, we investigate the dynamical behavior of tumor immune system response with and without the aid of Helper T cells. By analyzing the characteristic equations, the stability of two equilibrium point (tumor free equilibrium and tumor interior equilibrium). Hopf bifurcation occurs in the system which Helper T cells are involved. The convergence of each equilibrium point has been illustrated numerically. The numerical simulations result also shows the periodic solutions that occur in the modeled tumor immune system.

Optimization On The Combination Of Treatment For Non-Hodgkin Lymphoma

Muhamad Shafiq Idzham Bin Abdullah & Assoc. Prof. Dr. Rohanin Binti Ahmad

Cancer is a rising problem and the process of recovering or treatments varied according to each person diagnostic. Hence treatments can be combine in order to fulfill the requirement needed for a person. In this study, treatments that have been considered were CHOP and R-CHOP where both is chemotherapy and the difference between them is the Rituximab drug that infused into patients. This study focuses on the implementation of the Operational Research model which is the Linear Programming model. Several stages need to be follow to achieve the objective. The steps followed is a general guideline for implementing Operational Research in practice. The construction of the Linear Programming model is discussed and then the model is implemented in Wolfram Mathematica to achieve the result. The Linear Programming model is it to maximize the Overall Response Rate and based on several constraints that has been considered. The objective is to determine the number of cycles for each treatment in order to maximize the Overall Response Rate.

Analytical Solution Of Vehicles Traffic Flows

Mohamad Zulhilmi Bin Rosli & Dr Anati Bte Ali

This study was carried to model traffic flow of vehicles in urban dynamic traffic situation of long traffic congestion based on Lighthill, Whitham and Richard (LWR) macroscopic model. The traffic flow parameters; flow, density and velocity would be employed to generate first order nonlinear homogeneous partial differential equations (PDE). Calibration of Greenshield's model would be used based on data collected to fit a linear regression equation. The method of characteristics would be used to solve the systems of PDEs.

MHD Mixed Convection Flow Of Viscoelastic Fluid Past A Sphere With Newtonian Heating

Muhammad Faiz Bin Muhammad Zaini & Assoc. Prof. Dr. Sharidan Shafie

Viscoelastic fluid is a type of non-Newtonian fluid that exhibits both viscous and elastic characteristics. Recently, this type of fluid has attracted many researchers due to its important applications in many industrial activities, such as in petroleum drilling, as well as food and paper manufacturing. In this research, the effect of magnetic field on the mixed convection boundary layer flow of viscoelastic fluid past a sphere with Newtonian heating embedded in a porous medium is studied. In order to solve these problems, the dimensional equations that governed the fluid flow and heat transfer were transformed into dimensionless equations by using appropriate dimensionless variables. Stream functions were introduced, yielding a function representing velocities. Similarity variables were used to deduce the dimensionless governing equations into a system of nonlinear partial differential equations. This system was solved numerically by using the numerical scheme of Keller-Box method. Results on the effect of the viscoelastic parameter K , magnetic parameter, and mixed convection parameter λ on the velocity and temperature of the fluid flow have been shown graphically and discussed.

**Mixed Convection Flow of Viscoelastic Fluid over a Sphere under Convective Boundary
Condition Embedded in Porous Medium**

**Muhammad Fakhrullah Amni Bin Mohd Khairil Hisham & Pn Wan Rukaida Wan
Abdullah**

The study on mixed convection boundary layer of a viscoelastic fluid over a sphere which is embedded in porous medium under convective boundary layer of a viscosity fluid over a sphere which is embedded in porous medium under convective boundary condition is carried out in this paper. The boundary layer equations of viscoelastic fluid are an order higher than Newtonian (viscous) fluid and the adherence boundary conditions are insufficient to determine the solution of these equations completely. Hence, the augmentation on extra boundary conditions is needed in order to solve this problem. The governing partial differential equations are first transformed into non-dimensional forms and then solved numerically using the Keller-box method by augmenting extra boundary conditions at infinity. The numerical results obtained for limiting case are comparing with related outcomes in order to validate the present results. Results on the effects of the viscoelastic parameter in the presence of porosity and mixed convection on the skin friction and heat transfer as well as velocity and temperature profile have been discussed.

Flight Delay Analysis Using Statistical Method

Muhammad Nazrul Izwan bin Muhamad Nashirruddin & Assoc. Prof. Dr. Fahilah Yusof

Flight delay is one of the common factors that give high cost impact to airline companies. Therefore, in this study a statistical analysis is used to analyse the flight delay problems in selected airlines. Flight is considered delayed when an airline flight takes off and/or lands later than its scheduled time. The Federal Aviation Administration (FAA) considers a flight to be delayed when it is 15 minutes later than its scheduled time. Almost all of the airports having this flight delay problem, but the level of seriousness of the flight delay problem that happened in the airport differs from one airport to another. Hence, in this study three methods are used which are Analysis of Variance (ANOVA), Independence Test and Multiple Stepwise Regression. The data consist of average flight delay in minutes, maximum precipitation in millimeter and maximum temperature in Celsius for each airline which are AirAsia, Malaysia Airlines, Singapore Airlines and Thailand Airways that were obtained monthly from website. The results show the average flight delay and operation status performance of airlines are dependent upon the type of airlines. The maximum precipitation and maximum temperature are also found to have a significant contribution to average flight delay problems for all airlines under study.

Optimal Scheduling for Maximum Utilization of Operating Room Using Mathematical Programming Approach

Nik Fazera Binti Nik Azeman & Dr Zaitul Marlizawati Binti Zainuddin

In most hospital, schedules of operating room always present difficult tasks due to a wide range of variables such as availability of doctor, doctor preference, operating hours, and functionality of rooms. The lack of managing and scheduling in operating room results in the underutilization of expensive resources. Thus, it is important to schedule the operating room efficiently so that we can maximize the utilization of operating room in hospital. This research focuses on mathematical programming namely integer programming (IP) for assigning operating room time to different surgical groups on different days of the week in order to maximize operating room utilization. The formulation of objective function in IP model is to minimize the difference between the target hours and the allocation of operating room hours across each of the surgical groups. The aim of the objective function is to ensure that the total hours of operating room time actually allocated to each surgical group is as close as possible to the allocated target hours. The constructed of IP model will be solved by using LINGO software version 17 to obtain the optimal solution for operating room scheduling problem. Next, the schedule of operating room is created by using Microsoft Excel and it is based on the values of decision variables.

**Solving Double Diffusive Convection of Nanofluid in Porous Media Modelled by Boussinesq
Flow**

Noor Shafiqah Rahman and PM Dr Ong Chee Tiong

Abstract. The double diffusive convection of nano fluid in porous media was modelled by Boussinesq. This model was used for nano fluid includes the effects of Brownian motion and thermophoresis. The linear stability theory was employed to obtain the condition for the onset of convection. The effects of the solution due to the Rayleigh number, Soret parameter, Dufour parameter, Lewis number, nanoparticle Rayleigh number, nanoparticle Lewis number, modified particle-density increment parameter, modified diffusivity ratio, and control parameter have been analysed on the onset of convection. The sufficient conditions for the non-existence of over stability were also obtained. Three types of lower-upper bounding systems of the model were considered to be free-free, rigid-free and rigid-rigid respectively. The eigenvalue equations are obtained from a normal mode analysis and solved numerically by using Galerkin technique.

Economic Lot Size For Different Items And Rotation Schedule With And Without Setup Time For Production

Nor Atikaf Bt Rashid, Dr Nur Arina Bazilah Bt Aziz & Dr Syarifah Zyurina Bt Nordin

In industry, company need to consider important things that can give them more profit. For this case, Economic Lot Size (ELS) is the important thing that can help the company minimizes the production cost. In this paper, the study concentrates on the inventory problem and production run for different items in a single machine. The objective is to determine the cycle length of the productions by minimizing the setup and holding costs. After calculating the cycle length, Economic Lot Size (ELS) for different items can be determined by using given formula in methodology. The sequences of the rotation schedule with and without setup time also will be defined using Travelling Salesman Problem (TSP) method. This study also conducts a case study including some different items to construct a feasible schedule from the optimal rotation schedule.

Computation and Estimation of some Geometric Parameters for Mesh Objects

Nor Fitrah Binti Ramlan & Taufiq Khairi Ahmad Khairuddin

The estimation of geometric parameters such as area and volume of a surface based on polygonal mesh is a key of numerous algorithms for examples in robot visions, computer graphics, geometric modeling, industrial and biomedical engineering. This research aims to estimate surface area, volume and centroid of a 3D object based on the triangular mesh of the object generated from a mesh generator software. The triangular mesh object is the object that is partitioned into a finite number of triangles. Besides, this research will create a MATLAB GUI (Graphical User Interphase) that will automatically compute the surface area, volume and centroid of mesh object. In this research, the method used to approximate all parameters was actually based on the properties of vector. Furthermore, MATLAB and NETGEN Mesh Generator are mainly used in this research for the purpose of calculation. In this research, a few objects are used as examples which are sphere, cube, cylinder, torus and revolution. Consequently, increasing the number of element for the mesh object will lead to a better approximation for surface area, volume and centroid. On the other hand, the numerical calculation for estimating surface area is more accurate than volume.

A Study of The Dynamic of Hepatitis B Virus Disease Using A System of Ordinary Differential Equations

Nor Syazmin Binti Ramli & Dr Fuaada Binti Mohd Siam

Hepatitis B is the most common infectious disease in the world. Hepatitis B virus (HBV) spreads through vertical transmission which means that an infection is spread from a mother to her fetus during childbirth, and also horizontal transmission which means that person contact with blood from infected individuals. However, the infection is controllable and preventable by vaccination. The aim of this research is to study the dynamics behavior of hepatitis B virus disease. The study is divided into two parts such that case when there is no vaccination and case when there is vaccination is given in a population. In this research, a mathematical model for the hepatitis B virus disease is considered. The model is developed based on the Susceptible, Infected, Recovered (SIR) approach. This model contains a system of non-linear differential equations which can explain the dynamics of the disease in a population. The system is analyzed numerically using MATLAB R2014b. The stability analysis of each equilibrium point is discussed by using Jacobian matrix. In order to check the stability of the model, Routh-Hurwitz Stability Criterion method is employed in this research. The equilibrium point of this model is divided into two, disease free equilibrium point (DFEP) and endemic equilibrium point (EEP). The sensitivity analysis of the parameters involved in the model is also performed in order to determine the effect of different parameter values on the spread of the disease. It is shown that the dynamics of the disease is determined by the basic reproductive number R_0 . If $R_0 < 1$, the DFEP is stable and the disease always die out. On the other hand, if $R_0 > 1$, the EEP is stable as it exists and the disease persists at an endemic equilibrium state if it initially exists.

Modelling Rainfall Data According To The Number Of Adjoining Wet Days In Class (0,1,2)

Normas Murni bt Ali & Dr Shariffah Suhaila Syed Jamaluddin

The mean amount of daily rainfall is expected to be differences days by days possibly effects by some factor such as geographically location, topography and monsoonal winds. The aims of this study are to classify the rainfall data according to the number of adjoining wet days (0,1 and 2), finding the best model and determine whether the best model either classified of daily rainfall separately better than which grouped all rainfall data. Daily rainfall data from 8 rain gauge station over Johor area in Peninsular Malaysia for 15 years (2000-2015) are classified according to the number of adjoining wet days (0, 1 and 2). Class 0 is the amount of daily rainfall for a solitary wet day while the class1 is rainfall for all three sequences day and class2 is the rainfall for wet day that is enclosed by wet days on either side. Three probability distribution namely Gamma, Log – Normal and Mixed – Exponential distribution will be used to model the data set and the parameter will be estimated by Maximum Likelihood (MLE). The best model will be determined based on the minimum value by Akaike’s Information Criterion (AIC). Result show that the Log –Normal distribution is the best model for all tested distribution followed by Mix – Exponential distribution. It also found the model which grouped all rainfall classes together is better than model which classified daily rainfall separately.

Effect Of Stenosis On Generalized Power-Law Model Of Blood Flow In An Artery

Nornabila Najwa binti Zuhari & Prof. Dr. Norsarahaida S. Amin

The mathematical model of blood flow in a stenosed artery is considered. A stenosed artery is the result of atherosclerosis due to the growth of calcified plaque layer on the inner wall of the artery. Plaque can be built up by small injuries or hypertension to the blood vessel wall as we age and it can form a large mass inside the inner wall of artery. Blood velocity and pressure are important during surgery for observing the state of patient. Stenotic blood flow in the artery is considered to be two-dimensional, unsteady, axisymmetric and fully developed. The blood flow is characterized by the generalized power-law model taking the shear-thinning, the shear-thickening and Newtonian. The governing equations are solved analytically by Marker and Cell (MAC) method. The results are physically represented and analysed using Matlab. The results observed the effect of stenosis in wall pressure, streamlines, velocity, wall shear stress and axial velocity in an artery.

Analysis of Heat Transfer in a Rectangular Fin using Finite Element Method

Nur Adlin Lina bt Normisyidi & Yeak Su Hoe

The purpose of this study is to investigate the heat distribution in a rectangular fin fixed to a vertical rectangular base. Fin is also known as extended surface that is added onto a structure used to avoid the system from overheating by increasing the efficiency rate of heat removal. Fins surfaces are broadly utilized as part of industrial applications such as automobile, electrical chips, and refrigeration. In this study, the problem of heat transfer in a rectangular fin was addressed using a mathematical model with suitable boundary condition. The two-dimensional heat conduction equation and Poisson's equation are being used to govern the physical problem. Beside, an appropriate boundary conditions have been adopted which represent the actual scenario of a fin. There are two solutions provided in the report; (1) finite element method (FEM) and (2) finite difference method (FDM). FEM is known as one of the numerical technique for finding approximate solutions by using shape function interpolation while FDM approximates the differential equation and very easy to be implemented. The results from both methods are computed by using MATLAB 2011b. All solution to these methods will be compared with exact solution as to prove the accuracy of FEM. The results of these solutions shows that FEM is better choice and more accurate in solving two-dimensional heat transfer problem compared to FDM.

Once Upon A Game: The Mathematical Modeling Of Mafia Game Using Difference And Differential Equation

Nur Alia Fatiha binti Laililnizan & Prof. Dr. Mohd Nor Mohamad

This paper purposes is to enlighten the readers that there is mathematics everywhere, even when playing games. In this 21st century, games in education have become an increasingly famous topic in the field of educational technology and will continue to evolve. Students are more emotionally and intellectually invested in digital entertainment with the rise of internet culture which is all the reason that the usage of games is necessary in teaching and learning mathematics. (Mathematical Modeling of Minecraft). According to Oxford Dictionaries [1] the definition of games is a form of play or sport, especially a competitive one played according to rules and decided by skill, strength, or luck. There are many type of games which are video games, digital games, board games and party games.

In this paper, we will study a game called “Mafia” (also called Werewolf) which is an extremely popular party game that has transcend into digital game called Werewolf “Nightmare in Prison”. It can be described that Mafia is a game between informed minority and uninformed majority (A Theoretical Study of Mafia Games). The players are separated into two contending groups which are citizens and a mafia. The game objective is very straightforward, which is to eliminate the opponent group. There is two consecutive phases in the game which are day and night with specific arrangement of actions such as lynching amid the day. Additional powers is given to the mafia members such as they know each other and killing other players during the night whereas the citizens only advantage is they are larger in numbers of players.

Next, this paper proposes a simple mathematical model of the mafia game, which fundamentally is a pure death process with discrete time. It demonstrates the finding of the closed-form solutions for the mafia winning-chance as well as the advancement of the game. Additionally, the discrete properties of results as well as their continuous-time approximations are investigated.

It is found that equal winning-chance for both groups is conceivable if a relatively small number of the mafia members correspond to the square root of the total number of players in the game. In addition, the game unequivocally relies upon the equality and the parity of the total number of players in the mafia game.

Modelling the Relationship Between Factors Affecting Black Pepper Yield

Nur Amalina binti Ahmad Fuzi & Pn. Noraslinda Mohd Ismail

The roots and causes that triggered production of black pepper have been studied from all across the world. Although there are various information on different nutrients needed by black pepper plant through fertilizer applications, questions on which factors are contributing the most to yield still arise. Since consumption of fertilizers are assumed to alter the pH value of the soil, the interest of this study also lies to the effect of acidification of soil for black pepper crop. Therefore, this study is done to model the factors affecting the production of black pepper and estimate the parameters of the model using least squares method. The observation data used in this study is obtained from international source which is Agricultural Sciences Journal, 2014, 5, 466-473. The factors investigated in this study are the nutrients concentrations and soil pH level. Method of Multiple Linear Regression and Analysis of Variance are applied in this study to obtain the linear relationship between the factors and yield of black pepper and either any of the nutrients give significant contribution to the model. The nutrients that are significant to the yield of black pepper root is N, P, Ca, and Mg meanwhile variables N, K, Ca, and Mg are the significant variables to black pepper shoot yield. Besides, ANOVA reveals findings such that different levels of pH of soil do effect the production and growth of black pepper.

A Describing The Spread and Control of Ebola Virus Disease Using SEIR Model

Nur Amelene Aqilah Bt. Mohd Nor & Dr. Fuaada Bt. Mohd Siam

The purpose of this study is to analyse the transmission dynamics of Ebola Virus Disease using the modified SEIR model which is a system of ordinary differential equation. Ebola Virus disease is one of infectious disease that caused an infection from Ebola Virus species. The SEIR model consists of four groups which are Susceptible individuals S , Exposed individuals E , Infectious individuals I , and Recovery individuals R . In this model, the study about the SEIR model has been completed with vaccination and without vaccination to see the effect of vaccination on the spread and control of the disease. Beside that, Routh-Hurwitz Criterion method has been used to check the stability of the model. The basic reproduction number, R_0 also has been discussed to see the stability of the equilibrium points of the system. The equilibrium point of the system consist of two cases, which are disease-free equilibrium point (DFEP) and endemic equilibrium point (EEP). Both equilibrium points are stable but depend on the basic reproduction number, R_0 . All the calculations are shown in this study. All the numerical simulation are done using MATLAB in order to see the effect of the vaccination to system. We stimulate the model with and without vaccination by using the same parameters for different rates of vaccination.

**Mathematical Modelling Of Predator Prey Population:
The Logistic And Gompertz Growth Model**

Nur Amirah Binti Bakri & Dr Anati Ali

Mathematical model is one approach that can be applied to study the population dynamics. The current study has used the Logistic and Gompertz growth model to derive the prey population and from the prey's model, the predator's model is constructed. It is discovered that the predator's population growth models to be a new function. From the simulation study, the predator population size eventually converges either to positive limit or zero or diverges to positive infinity. In order to get the results, Maple software is used to construct the graph of prey and predator population. Next, the stability of equilibrium points for both model is obtained, and it is found that there are two equilibrium points that are stable under a certain condition. In general, population growth model is the best way to investigate the predator prey problem.

Hydrological Trend Analysis using Parametric and Non-Parametric Test

Nur Aqilah binti Rozaini & Dr. Norazlina Ismail

In this paper, non-parametric tests is employed for trend analysis of rainfall, temperature, stream flow and drought in verifying the upward and downward trend. Parametric test, linear regression is applied to analyse the relationship between rainfall and stream flow. Standardized precipitation index (SPI) is used as a tool to classify the rainfall precipitation to determine the drought occurrence. About 31 years (1986-2016) of rainfall and stream flow annual data and 10 years (2007-2016) of temperature data are obtained from different stations in Malacca are analyzed to characterize the trend of hydrological data. Mann-Kendall test is employed on these hydrological data for trend identification and further verified by applying Theil-Sen estimator. The Theil-Sen results describe that only Pekan Merlimau (R01) and Duyong (R06) has significant downward trend for rainfall stations in Malacca. The analysis of annual temperature shows that only ALAM (T01) and Batu Berendam (T04) have a significant upward trend. For stream flow, only Sg. Melaka (SF02) has a significant upward trend. For drought events in Melaka, it has a significant upward trend. The result of simple linear regression shows that only Sg. Kesang versus Hospital Jasin, Sg. Melaka versus Bahagian Garing and Sg. Durian Tunggal versus Sg. Bharu has significant positive linear relationship between stream flow and rainfall. It can be concluded that increasing of stream flow is due to the increasing of rainfall intensity for these three stations.

**Construction Of Algorithm For Parabola, Circle And Ellipse By Using Huzita- Justin
Axioms**

Nur Arisha Binti Mohd Azhar & Dr. Niki Anis Ab Karim

The ability of origami (paper folding) in providing solutions for cubic equations through the formation of tangents of two parabola spiked up an interest in delving on the extensions of origami and other conic sections. With the aid of single fold operation called Huzita-Justin axiom, identification on steps of single fold is able to be formalized. The main interest of this study is to provide algorithm for construction of basic conic sections, parabola, circle and ellipse also in producing two-fold operation by using two instantaneous HJA. The algorithm for folding will be including terms of folding as specified by Huzita-Justin axioms. The algorithm specifies on constructions of multiple tangents which physically done by hand that will make up a whole shape. Then, several possible constructions is provided by using the provided algorithm as a case example to identify the situations needed for a complete shape. The cases were built by varying the positions of the focus, directrix and number of folds exerted on a 21×21 cm paper. Then, definition of eccentricity is applied to the finished constructions. For formation of two- fold operations, two instantaneous operation of HJA is combined and be treated as a set with a binary operation. Constructions of folding enable the identification of possible points and lines that provide a well-defined shape whereas 49 two-fold operation was identified from the combination of HJA.

Binary Linear Programming In Solving Bus Crew Scheduling Problem

Nur Atika Masbah, Dr. Syarifah Zyurina Nordin & Dr. Rashidah Ahmad

In this study, we consider a Crew Scheduling Problem (CSP) of bus transportation with the objective of minimizing the cost of crew in covering the set of task. We address a different time frame to determine the optimal number of crew members. The maximum total working limit for each crew member has been set. A Binary Linear Programming model is developed to obtain an optimal solution for the problem. In the case study, we are considering two parts of problem which is for part time crew and full-time crew to cover the given set task. We conduct a testing and implement it using LINGO software. Results of the computational testing are present and show that the proposed model gives the optimum value for the problem. Besides that, we are constructing a feasible schedule for driver in covering all set of task.

Ant Colony Optimization Algorithm For Distance-Capacitated Vehicle Routing Problem

Nur Atiqah binti Amral & Dr. Farhana Johar

The vehicle routing problem (VRP) with distance and capacity constraints involves the design of a set of delivery routes which originate and terminate at a central depot after satisfying the customer demands. Each customer must be served exactly once by one vehicle, where capacity and distance limit becomes the constraints of the problem. In this study of Distance-Constrained Capacitated Vehicle Routing Problem (DCVRP), ant colony optimization method is used to construct an improvement solution. The method focus on choosing the customer with highest probability from one node to another nodes without violating distance and capacity constraints until one vehicle complete visiting all customer. C++ numerical programming is used to code the proposed algorithm in order to solve DCVRP which involves large groups of data. Three categories of data is used (cluster, random and random cluster data) to be analyse by considering different values of distance and capacity constraints. By utilizing the ant colony optimization method, the number of routes participated and the total distance travelled by the vehicles can be obtained. Based on the computational results acquired, the increasing value of capacity and distance constrained will reduce the number of routes formed as well as the total distance travelled.

Boundary Element Method on Solving Laplace Equation using Constant and Linear Element

Nur Azira bt Jasman & Dr. Yeak Su Hoe

Laplace equation, which are in the form of second-order partial differential equation (PDE) were widely used in many problems related to engineering and science studies. Boundary element method (BEM) was proposed as a suitable numerical method on solving Laplace equation as it can translate the domain integral into complete boundary condition. BEM was developed based on the idea of boundary integral equation (BIE) and finite element methods (FEM). As for that, it has been used as an important alternative solution technique to finite difference method (FDM) and FEM where the solution to the PDE inside the domain is based on the solution to the boundary. In this study, the solution to the Laplace equation is presented in BEM by using constant and linear element via BIE formulations. The related problem of BEM calculation is coded and developed in FORTRAN program where the result is then validated with exact solution and its accuracy are compared with FDM. In general, BEM is less complex when solving boundary value problem rather than FDM and FEM which solve the whole domain of interest. The results show that linear element is more accurate than constant element. In conclusion, BEM can be said as a superior method in solving Laplace equation.

Logistic Regression With Categorical Data In Online Shopping Susceptibility

Nur Ezzati binti Abdul Manap & PM Dr. Ismail Mohamad

The popularity of online shopping increased along with the development of Internet around the world. Through this study, it helps the online retailers to focus on the most common influential factor for the consumer to shop online. The aim of the study is to investigate the common factors that determine customers' choice of online shopping. Online survey study was conducted. The obtained data is filtered to omit any missing data which resulted in only 90 respondents' survey results were selected. The factor analysis and binary logistic regression are used as the statistical technique in this study. Factor analysis illustrates there are five factors being considered by potential online buyer which are easy and convenience, assurance, marketing, knowledge and skill, as well as price. From these five factors, eight independent variables are chosen to be analyzed in binary logistic regression. Binary logistic regression was applied for parameter estimate and understanding the output of logistic regression, including the significance of individual predictors as well as the odds ratio. The final result shows that only two independent variables are significant which are the buyers' feel of confident their personal information is protected by internet retailer and the internet retailer honor their product guarantees.

Solving Two Dimensional Heat Equations Using Alternating Direction Implicit (Adi) Method

Nur Fariha binti Bharun & En. Che Rahim Che Teh

The heat equation is widely used to solve many problems related to heat, such as convection, conductivity and radiation. These problems can be solved analytically and numerically. However, the analytical approach for two-dimensional equations is more complicated than for one variable. Therefore, a numerical approach will be used as an alternative. There are various types of numerical methods that can be used to solve the heat equation. It is usually necessary to make scientific calculations in a long way and steps in accordance with the chosen method. As for the Alternating Direction Implicit (ADI) method, calculations and iterations can be reduced and less costing, because ADI uses a tridiagonal system in its calculations that is famous for simplifying calculations.

Periodic Solutions of Second-Order Neutral Delay Differential Equations with Piecewise Constant Arguments

Nur Fatin Kamila Binti Zanalabidin & Assoc. Prof Dr Mukhiddin Muminov

The purpose of this research is to describe all conditions and properties for solving periodical solutions of second-order neutral delay differential equations with piecewise constant arguments having the form of $x''(t)+px''(t-1)=qx([t])+f(t)$, where $[.]$ denotes the greatest integer function, $f(t)$ is periodic and p,q are nonzero constant. The process and steps of deriving the conditions of periodical solution of the differential equation has been studied. Also, explicit formula for the 2- and 3-periodic solutions of the equation are obtained. This research also provides some counterexamples for uniqueness of 3-periodic solutions that has been discussed in some articles.

Fibonacci Number and The Golden Ratio in Web Design

Nur Fatin Azma Binti Rasidi & Dr Amidora Idris

Fibonacci Sequence is the sequence that is formed by solving the rabbit problem by Leonardo Fibonacci. Decade later, other mathematicians realise that Fibonacci Sequence is related to the famous Golden Ratio by using this formula, F_n/F_{n-1} . By repeating the process, in the end, the ratio of the Fibonacci Sequence is equivalence to 1.61803 which is also known as the Golden Ratio. The concept of the Golden Ratio has been used widely in our surrounding nowadays. In addition, this concept has been applied on architecture, music, designing, the concept of beauty and many more. Moreover, the design of the website in the internet also applied the concept of the Golden Ratio. The concept is known as the Grid Theory and the simplified concept of the Golden Ratio, the Rule of Thirds. In this study, the application of the Golden Ratio in web designing using the Golden Rectangle concept was investigated. Other than that, this study use Blogger to represent the web design that applied the Grid Theory while Wix represent the web design without using the Grid Theory. Hence, both web designs were compared to show that the application of the Golden Ratio in web design is better than the web design without using the Grid Theory.

**Modelling Malaysia Rubber Price Using Autoregressive Integrated Moving Average,
Generalized and Asymmetric Power Autoregressive Conditional Heteroskedastic**

Nur Idayu bt Masani & Dr Norazlina bt Ismail

Over two decades the number of planted area and production of natural rubber has decreases. The estates are now less significance in most countries including Malaysia, but products made from natural rubber essential to modern life and this cause the rubber price to be unstable. Hence, it is important to make a prediction of rubber price so that government and private organization can develop a better understanding of its price dynamics, and the consumer or supplier of rubber can make more informed decision or planning in the future. Three models, ARIMA, GARCH and APARCH models are used to modelling the daily data SMR20 F.O.B Cent/Kg, Malaysia rubber price. The R software are used in the analysis and error measure will be calculated that are mean squared error (MSE) and mean absolute error (MAE). From the analysis, the data show long memory, clustering of volatility and excess kurtosis. Among the three models, GARCH model is the suitable and appropriate model in modelling the daily data of SMR20 F.O.B Cent/Kg, Malaysia natural rubber price since it has the smallest value of MSE and MAE.

A Mathematical Study of Predator-Prey Dynamics with Disease in Predator

Nur Sabariah Binti Ajis & Dr. Faridah Mustapha

In mathematical ecology, the predator-prey models with disease are known as eco-epidemiology. The infectious disease has important roles in the dynamics of a predator-prey dynamics. In this study, two models are used to investigate the stability analysis of the equilibrium points. First model is a predator-prey without disease and the second model is a predator-prey with disease where parasitic infection is spread only in predator population. In the first place, equilibrium points of both models are obtained. Routh-Hurwitz Criteria are used to determine the conditions needed to analyse the stability of equilibrium points. The possible outcomes of the stability of the system are analysed theoretically and some numerical simulations are shown. MATLAB R2016a software is used to plot the graph and demonstrate the stability of the system in the certain domain and Maple 8 software used to find the stable eigenvalues for both systems. The results obtained from model 2, conditions for disease free are obtained and also conditions for persistence of disease are also obtained.

Nur Safirah bt Baharuddin & PM Dr. Fadhilah Yusof

One of the main purpose of this study is to apply multiple regression analysis using daily and monthly data of the Air Pollution Index(API) in Senai on several different climate variables. Some variable selection procedures are used such as Forward Selection, Backward Elimination and Stepwise Regression for comparing which one is the best method that can be selected in building the models. This study give a prediction on the API value in the area for a short and long term by investigating the relationship between correlation and lag of time in days and months of the climate variables towards API. The information obtained is very crucial in helping and making sure the air quality in the selected area is satisfactory , poses little or no risk in the future. The challenge to maintain a good quality air to the citizen is still becoming a major problem to the government as the excessive development in an area will lead to pollution causing from the vehicle and factory. Senai is chosen because this is one of the area in Johor Bahru that is in a process of growing up as the main airport is located here. The data from January 2007 to December 2009 were obtained from Malaysia Meteorological Service. Lag of days and lag of months of the climate variables are the main focused in this study and act as independent variables while API as dependent variable . The results show that regression models using using monthly data have bigger R-Squared value compared to regression model using daily data which indicates the monthly data is a better model to give the better prediction.

Derivation of Boundary Layer Equation

Nur Syafiqah binti Husin & Mohd Ariff bin Admon

The heat and mass transfer in the boundary layer region has broad applications in industries such as the aerodynamic extrusion of plastic sheets and glass fiber production. Boundary layer theory can be seen in the calculation of skin friction drag that acts on a body when it moves through all kind of fluid. In this study, the equation of motion for fluid flow is derived in three-dimensional body. Physical principles such as conservation of mass, Newton's second law and conservation of energy are used in the derivation. Furthermore, models of infinitesimally small element fixed in space and moving with the fluid flow are considered to illustrate the physical interpretation. The equation of motion is reduced to boundary layer equation for free convection flow on isothermal surface.

ANN Versus SVM for Classifying the Eye Movements Using EEG Signals

Nur Syahirah Binti Abdul Aziz & PM Dr. Norma Alias

In recent years, electroencephalogram (EEG) is becoming increasingly crucial in the diagnosis and treatment of mental and brain neuro-degenerative diseases and abnormalities. The main diagnostic application of EEG is in the case of epilepsy. Thus, it is give various uses and significance in Brain Computer Interface (BCI) system. This paper is intended to study the use of feature extraction to decompose a filtered EEG signal obtained from two different samples of EEG data and reduce the dimensionality of data. The first sample consists of five healthy volunteers while the other sample encompasses five patients that was be correctly diagnosed to be the epileptogenic zone. The feature extraction approaches in this study is discrete wavelet transform (DWT). This feature would then become inputs to both artificial neural network (ANN) and support vector machine (SVM). The performance of the combination of feature extraction method and classifiers was presented and analyzed. It was found that discrete wavelet transform + SVM achieved the highest classification accuracy of 88.65%.

Morphology of Fuzzy Topographic Topological Mapping

Nur Syahirah binti Mohd Salehudin & Prof. Dr. Tahir Ahmad

Fuzzy Topographic Topological Mapping (FTTM), is a model that have been developed to solve neuromagnetic inverse problem by Fuzzy Research Group in 1999 at UTM. Since then, FTTM has branches out in various Mathematics field like Topology and Number Theory. FTTM have four components of Topological Spaces which are Magnetic Countor Plane (MC), Base Magnetic Plane (BM), Fuzzy Megnetic Field (FM) and Topographic Magnetic Field (TM). In 2002, Liau Li Yun has shown that these four topological spaces are homoemorphic to each other by initially showed that there exists homeomorphism between a sphere, S^2 and an ellipsoid, E^2 . In 2009, Siti Suhana has proved that if there exist n numbers of FTTM, then $n^4 - n$ new FTTM will be generated by using the geometrical features of FTTM. In this report we will study on the Morphology of Fuzzy Topographic Topological Mapping which is a study on how FTTM was formed and the relationship of FTTM to the other field of Mathematics.

Mathematical Modelling Of Heartbeat

Nur Syahirah Sahril & Prof Dr Ali Hassan Mohamed Murid

This report is concerned with mathematical modelling of heartbeat activity. The heart is an organ in human body which mainly function to pump deoxygenated blood to lung and oxygenated blood to all over the body. In this small organ, there are four different chambers and four valves with different characteristics and different functions to help heart pumping the blood. In this report, all main features of heartbeat activity is included in the mathematical model. The stability analysis and phase plane are also included regarding to heartbeat behaviours.

Solving System Of Nonlinear Equations: Methods And Applications

Nur Syarmila binti Romainor & Dr. Shazirawati binti MohdPuzi

A system of nonlinear equations is arise in many problems in the fields of science and engineering fields and it is quite complicated to find the solution especially when the problem is singular. There may have no solution or multiple solutions for solving this systems. The exact or analytical solution are limited. Thus, a numerical method is needed to obtain an approximate solution. This research is conducted in order to study the performance of three different methods which are Newton's method, Broyden's method and steepest descent method. By applying the algorithm of each methods, the numerical experiment is performed to obtain the solutions in solving the real life problem, specifically in the problem of flow distribution in a pipe flow network, temperature distribution in rectangular fin, and coupled reversible chemical reactions. The numerical comparison among methods is conducted to analyzethe accuracy of each method. The results shows that Newton's method is more robust in terms of iteration number, k compared than Broyden's method and steepest descent method. For the convergence rate and residual vector, Newton's method have less value of convergence rate and smaller residual vector compared than other methods.

Evaluation of Ruin Probability for Heavy and Light-Tailed Distribution in Health Insurance

Nur Syaza Aqilah Binti Zaini & Dr. Arifah Binti Bahar

This study is about the evaluation of ruin probability for medical and health insurance claims. In other words, ruin will happen when the insurer's surplus gets to a specific lower bound. Risk of ruin is a concept in gambling, finance, and insurance that correlates to the likelihood of losing all one's investment assets, which is also known as probability of ruin. Poisson process is used in calculating and investigating the ruin probability. This study uses the data of the medical and health insurance claims from June until December in 2014. The data has been analysed numerically in order to determine the best fit of distribution with the help of Anderson-Darling test. The amount of claims distribution for all types of illnesses is right-skewed and heavy-tailed. A suitable statistical distribution that fit the best for the medical and health insurance claims has been discovered and discussed.

Risk Factors Influencing Academic Performance of a Mathematical Course in a Public University Using Multiple Linear Regression

Nur Zulaika binti Zainalabidin & Dr. Zarina binti Mohd Khalid

Academic performance is very important especially for students and this study was conducted to examine the factors influencing academic performance of students of Universiti Teknologi Malaysia (UTM), Johor Bahru campus. This study aims on civil engineering students of Faculty of Civil Engineering who registered for Engineering Statistics course in Semester 1, Session 2017/2018. A total of 106 data were collected directly from students through a simple questionnaire. For analysis, a method namely multiple linear regression was used to investigate the effect of different factors on student's achievement and to know the best model obtained from three different model selection approach which are forward selection, backward elimination and stepwise regression. The variables under consideration were the student's marks in Engineering Statistics course as the dependent variable and the section, age, gender, race, year of study, pre university education, number of extra co-curricular activities involved, revision hours per week, place of lectures, first time course and CGPA were independent variables. Analysis was done by using SPSS (Statistical Package for the Social Sciences). The findings revealed that year of study and CGPA of students significantly contribute to the academic performance of students in Engineering Statistics course and the best model was obtained from forward selection method. This study was also attempts to identify other factors that were not being included in this study to improve the academic performance of students.

Application of Support Vector Machines (SVMs) for rainfall forecasting in Johor state

Nurainaa Syaza binti Rushdan & Dr. Norhaiza binti Ahmad

Rainfall forecasting is a very important part in hydrological research. Rainfall forecasting consists of plentiful amount of data and need complex procedures to carry out it. This study presents about Support Vector Machines (SVMs) model for forecasting nonlinear monthly rainfall data. Rainfall data for thirty-three year periods was collected from 13 rain gauge station which is included in the analysis of data. Rainfall data's Endau is selected as subject research. Seventy percent (January 1975- March 1981) from that data was selected as training data while thirty percent (January 2006-November 2008) become as data test. Empirical results show that the model gives a better performance with a shorter lag which depends only Lag 1 Endau.

Ant Colony Optimization Algorithm For Capacitated Vehicle Routing Problem

Nuraliah binti Zamberi & Dr. Farhana Johar

The Capacitated Vehicle Routing Problem (CVRP) is a well-known combinatorial optimization problem which is concerned with the distribution of goods between the depot and customers. It is of economic importance to businesses as approximately 10-20% of the final cost of the goods is contributed by the transportation process. The purpose of this study is to generate a feasible solution for Capacitated Vehicle Routing Problem (CVRP) by using Ant Colony Optimization (ACO) algorithm. Our case study is to solve CVRP involving 100 customers of random, clustered, and random-clustered data with the properties of CVRP that every customers is visited by exactly once with only one vehicle where the total demand on each solution route must be within the vehicle's capacity limit. In this research, we used C++ programming to code the Ant Colony Optimization algorithm in order to generate a feasible solution of the CVRP by developing the pseudocodes for the algorithm first. Computational experiments were conducted on benchmark data set and the results obtained from the proposed algorithms shown that the total distance travelled decreased when the capacity limit of the vehicle increases. Further research should be extended under the field of Vehicle Routing Problem with various parameters. In other words, this extension of this routing problem becomes a combinatorial optimization problem with many limitations, which should be solved by the hybrid methods.

Gamma Function and Its Application

Nuralisa Shazlin Mohd Hassan & Che Lokman Jaafar

Gamma function is one of the most important special functions which has many uses in mathematics and applied sciences. Gamma function is the continuous extension of factorial function for positive integers and also can be represent in integral form for positive real numbers. The purpose of this research is to carry out analysis of Gamma function properties, definitions and theorems to derive and solve some mathematical problems especially to tackle some integration problems that cannot be solved by using elementary methods. Relationship between gamma function and Beta function is also included in this research. Several examples of application also have been shown to give a better understanding about gamma function.

Analytical Solution of Burgers Equation

Nuratiqah Binti Samat & Assoc. Prof. Dr. Ong Chee Tiong

Burgers equation is a nonlinear partial differential equation (nPDE) of second order arises from fluid mechanics. It will model the fluids flow and the forces acting on them. It has nonlinearity and dissipation effects. The balance between these two effects will produce solitary waves which are known as a soliton. In this research, we involve the Cole-Hopf transformation method to solve the Burgers equation in order to obtain the analytical solution. This method will reduce the nPDE of Burgers equation to a linear heat equation. Maple software programming was chosen to generate the graphical outputs with various parameter changes.

A Prey-Predator Model with A Reserved Area

Nurhashimah Bt Bahri & Dr Faridah Mustapha

In ecology, predation can be defined as the interaction between two or more species, likely when one organism captures and consumes biomass from another. Due to the uncontrolled predation, it can lead to the extinction of either prey or predator or both species. Thus, two prey-predator model is proposed and analyzed to study the occurrence of the coexistence of both prey and predator species. First model to analyze is the prey-predator model without reserved area and the second model is prey-predator model with a reserved area for the prey species. The equilibrium points are obtained. The stability analysis of the prey-predator system is addressed. Numerical simulations are shown using Matlab R2016a and Maple 8 software. The stability conditions for the coexistence of species are obtained according to Routh-Hurwitz Criteria. The effect of prey carrying capacity and prey migration rate on the stability of the equilibrium points in the models are discussed.

Comparison of Singular Spectrum Analysis and Autoregressive Integrated Moving-Average model on Forecasting Tourist Arrival to Langkawi.

Nurul Ain Binti Mohd Azli & PM Dr. Ani Bin Shabri

Tourism is competitive industry in the world that will affect a major source of foreign exchange, employment opportunities and tourism industry in Malaysia. As a one most wonderful island in Malaysia, Langkawi is the competitive island to achieve the tourism goal. Therefore, it is becomes necessary to understand the tourist distributions which is can provided the best information for tourist market segmentations in Langkawi. The main objectives of this study are to forecast the tourist arrival to Langkawi by ferry, domestic flight and International flight by using Singular Spectrum Analysis (SSA) and Autoregressive Integrated Moving-Average (ARIMA) model. For this study, suitable window length of SSA also will be determined by comparing the forecasting accuracy from different window length. The forecasting accuracy of each models has been evaluate based on performance of root mean square error (RMSE), mean absolute error (MAE) and mean absolute percentage error (MAPE). The monthly tourist arrival to Langkawi was obtained from Langkawi Development Authority (LADA) websites. The data is about the total numbers of monthly tourist arrival to Langkawi by ferry, domestic flight and International flight from 2002 until 2017. From this study, the results shows that ARIMA model produces minimum values of MAE, RMSE and MAPE for each data of tourist arrival to Langkawi by ferry, domestic flight and International flight. Besides, the predicted values by using ARIMA model are more accurate with actual values compared to SSA method. Therefore, it shows that ARIMA model are practical and feasible for forecasting tourist arrival to Langkawi.

Capacitated Vehicle Routing Problem for Goods Delivery by Using Tabu Search

Nurul Alyaa'binti Norazam & Wan Rohaizad bin Wan Ibrahim

In ensuring that the performance of a transport and delivery companies are always at a satisfactory level, the needs and demands of the customers should always be met. However, at the same time the cost of finance and distance travelled need to be optimized. Therefore, this study focuses on the method used for Kokubu Food Logistic Malaysia Sdn. Bhd. in delivery of food products to Sushi King Restaurants in the Klang Valley (Kuala Lumpur), Klang Valley (Selangor), Negeri Sembilan, Malacca and Johor using Tabu Search (TS) to maximize the Capacity Vehicle Routing Problem (CVRP). The main purpose of this study is to optimize the route for two vehicles that start and end from central depot to each location as well as to compare the results between the greedy and TS methods. To solve this problem, C++ programming has been used to solve the CVRP which involves large data sets. Hence, computer results indicate the nearest distance that should be passed by two vehicles for a total of 63 locations. This report describes the chosen solution method and the final solution being produced. Finally, a brief chapter on future proposals is available.

Correspondence Analysis In Evaluation Of Employees' Performance

Nurul Atiqah Binti Mohd Razali & Dr. Muhammad Fauzee Hamdan

Correspondence Analysis (CA) is a geometric data analysis methodology whose main goal is to represent tabular data graphically, facilitating by this manner the numeric table interpretation. The basic idea behind such a methodology is that any matrix of positive numbers viewed as some form of contingency table concatenation can be summarized into a series of 2D graphs that plot data with respect to two perpendicular coordinate axes, calibrated for a common scale. Avoiding as much as possible unnecessary a priori assumptions, the interpretation of such graphs allows for detecting and evaluating the pattern of relationships between rows and columns of the input table. In this study, correspondence analysis is applied in human resources. The data is taken from a several employee to uncover the factors that lead to increase the employees' performance. The data is analyzed by using Statistical Package for Social Science 16 (SPSS 16).

Analysis of Drought Over Peninsular Malaysia

Nurul Shuhada binti Mohamad & Dr Shariffah Suhaila binti Syed Jamaluddin

Daily precipitation data of twenty-eight rainfall stations in Peninsular Malaysia from the year of 2000 to 2015 are analyzed to determine the best fitted model before applying Standardized Precipitation Index. A threshold of seventieth percentile is applied to the data to be characterized as drought in order to profile the statistic descriptive of drought events. Three distributions are tested which are Gamma, Weibull and Lognormal distribution. The best fitted model is chosen based on the minimum error produced by the goodness-of-fit tests used. The classifications of drought events are interpreted by employing Standardized Precipitation Index according the Northeast and Southwest monsoon. The rainfall amount for each station is categorized into seven categories which are, extremely wet, moderately wet, severely wet, near normal, moderately dry, severely dry and extremely dry. The computational of SPI is based on Lognormal distribution and the monsoon periods. The results are the eastern and southwestern parts show the higher probability for the wet events and the less precipitation received during the dry events are affected most of Peninsular Malaysia during Northeast monsoon. During Southwest monsoon, it shows that eastern part receives less precipitation during the wet events while the majority of the region are expected to experience the wet events.

Fibonacci Numbers in Different Slant of Pascal's Triangle

Nurul Syafiqah bt Ab Wahab & Dr. Amidora bt Idris

Number theory is the branch of mathematics that studies the properties and relationship between particular types of number. There are many types of numbers in mathematics such as Natural Numbers, Prime Numbers and Fibonacci Numbers. The purpose of this study is to investigate the existence of Fibonacci Numbers in different slant of Pascal's Triangle. So, some particularly important sets of numbers are introduced and the concept of sequences in particular Fibonacci Numbers with some related properties are investigated. In this study, the formation of Pascal's Triangle and patterns that prevail in Pascal's Triangle are discussed. Fibonacci Numbers is one of patterns that exist in Pascal's Triangle when diagonals of Pascal's Triangle are sum up. However, it is not easy to see the diagonals in Pascal's Triangle and that is the reasons why the slope of Pascal's Triangle is changed. Hence, the existence of Fibonacci number in Pascal's Triangle can be identified easily. Therefore, mathematical presentation and visual interpretation of patterns in Pascal's Triangle are presented.

Modelling Used Car Price Using Multiple Linear Regression

Nurzaira Syakirah binti Mohd Zaidi & Dr. Zarina Mohd Khalid

Used car market is a challenging business for both seller and buyer. This study is conducted with the purpose to help the seller and buyer by developing a regression model for predicting the price of used cars and analysing the factors affecting the reselling price. The analysis is carried out using multiple linear regression with the help of statistical software, SPSS in which forward selection, backward elimination and stepwise regression method are utilized to model a total of 156 set of data regarding used cars obtained from Carlist.my. Malaysian automobile brands, Proton and Perodua and influencing factors such as make, age, mileage, interior style, gear transmission, engine capacity (litre) and number of seats have been selected for this study. The principle factors affecting the price of a used car are make, age, interior style, gear transmission, engine capacity and number of seats. A Proton car has a lower reselling price compared to Perodua car and the reselling price tends to be lower with the increase of car's age and when the gear transmission of the car is manual. On the other hand, leather seats, bigger engine capacity and more number of seats will result on a higher reselling price.

Forecasting Rainfall Using Sarima Model For Project Planning In The Construction Industry

Reenusha Pakianathan and Dr Muhammad FauzeeHamdan

Construction industry is one of the cannonading industries of today which contributes greatly in the economic growth of a nation. However, this industry is continuously facing severe concern of time overrun where it decelerates the multiplier effects to the economy. It has become an essential need that effort be taken to lessen these overruns in time despite amplified uncertainties and complexities. Climate and weather conditions are often reported as one of the main causes of project delays and unscheduled changes. Hence, to reduce the time overrun, forecast of the weather is crucial to this industry. In this study, the monthly rainfall frequency in Johor is analysed. SARIMA model is used to analyse and forecast the monthly rainfall frequency. RStudio is used to analyse the data. The goodness of fit of the SARIMA model is measured using Akaike's Information Criterion (AIC). SARIMA (0,0,1)(0,1,1)₁₂ is chosen as the model in this study. Forecasting accuracy of the model is accessed using Root Mean Square Error (RMSE). A software is developed using C++ where the forecast of monthly rainfall frequency is stored. This software calculates estimated project completion month by taking project start month, man days needed and rainfall frequency into account.

The Commutativity Degree And Relative Commutativity Degree Of Nonabelian Metabelian Groups Of Order At Most 31

Rosnita Binti Abdul Shukur & Assoc. Prof. Dr. Nor Muhainiah Mohd Ali

Let G be a finite group. The probability that two elements of the group G commute is called the commutativity degree of a group G . The concept of commutativity degree plays a significant role in determining the abelianness of the groups. There is another type of probability which is the relative commutativity degree of a subgroup H of a group G defined as the probability for an element of H to commute with element of G . The purpose of this study is to determine the commutativity degree and the relative commutativity degree for cyclic subgroups of nonabelian metabelian groups of order 25 to 31. A metabelian group is a group G that has at least a normal subgroup A such that A and G/A are both abelian. The Groups, Algorithms and Programming (GAP) software has been used to assist this study in finding the number of cyclic subgroups for each group meanwhile the 0-1 table has been obtained manually based on the Cayley table of each group. By using the results obtained and the previous results related to this study, all commutativity degree and relative commutativity degree for cyclic subgroups of nonabelian metabelian groups of order 25 to 31 are determined.

Forecasting Of Gold Prices Using Arch And Garch Model

Sakthiswran a/l Arumugam & Prof Dr. Zuhaimy Ismail

Gold is the most valued, cherished and treasured commodity across the globe. Gold is generally utilized as a part of creating pieces of gems and coins. With the transformative change in the financial market, the interest in gold continued expanding in an unfaltering way. Since gold prices are not constant, numerous statistical models on forecasting the prices of gold have been developed. In this research, monthly gold prices from January 2005 to June 2017 in United States Dollar (USD) per ounces is utilized. The data is collected from www.kitco.com. The study will focus primarily on ARCH (1) and GARCH (1,1) model to forecast future monthly gold prices. In addition, Moving Average models such as MA (2) and MA (3) is likewise utilized in this forecasting process. ARCH (1) and GARCH (1,1) model was analysed using EViews Version 9 and the MA (2) and MA (3) model estimations were done in Microsoft Excel 2013. Following a brief overview of the observed period, model adequacy test and forecasting of monthly gold prices for the period from January 2017 till June 2017 was carried out. The performance between these methods is made by computing the mean absolute percentage error (MAPE). The MAPE values obtained for MA (2), MA (3), ARCH (1) and GARCH (1,1) is 2.03966, 3.10468, 1.88773 and 1.84127 respectively. Therefore, the GARCH (1,1) model is more accurate in forecasting monthly gold prices.

The Commutativity Degree Of Nonabelian Metabelian Groups Of Order 32

Selly Septy Nurmy Mohd Yatim & Assoc. Prof. Dr. Nor Muhainiah Mohd Ali

A metabelian group is a group G that has at least a normal subgroup A such that A and G/A are both abelian. Equivalently, G is metabelian if and only if the commutator subgroup of G is abelian. In other side, the concept of commutativity degree plays an important role in determining the abelianness of the group G . The probability that a pair of elements of a finite group commute is called the commutativity degree of the group. The main objective of this research is to determine the commutativity degree of nonabelian metabelian groups of order 32. In this research, the 0-1 table that obtained from the Cayley table and the conjugacy classes of the groups are determined. By using both results with an assistance from Groups, Algorithms and Programmingsoftware, the commutativity degree of nonabelian metabelian groups of order 32 are determined.

Homological Functors of Subgroups of Symmetric Group of Order 24.

Sharmilly A/P Thurai Raja & Prof. Dr Nor Haniza S armin

Homological functors of a group including the nonabelian tensor square were originated in algebraic K-theory and homotopy theory and was introduced by Brown and Loday in 1987. The nonabelian tensor square, $G \otimes G$ of a group G is generated by the symbols $g \otimes h$, where $g, h \in G$, and subject to the relations $gg' \otimes h = ({}^s g' \otimes {}^s h)(g \otimes h)$ and $g \otimes hh' = (g \otimes h)({}^h g \otimes hh')$ for all $g, g', h, h' \in G$, where ${}^s g' = gg'g^{-1}$. The homological functors of symmetric group of order six have been computed in previous research. Extending the results, the nonabelian tensor square and homological functors of some subgroups of symmetric group of order 24, S_4 , are determined in this undergraduate project. Groups, Algorithms and Programming (GAP) is used to verify the nonabelian tensor square and to determine some of their homological functors. Manual (hand) computations based on the definition for the nonabelian tensor square of the subgroups of symmetric group of order 24 are also shown in the report. It is found that the nonabelian tensor square of three subgroups of order eight of S_4 is isomorphic to dihedral group. Hence, the homological functors which are determined based on dihedral group are shown in this report.

Traveling Salesman Approach For Solving Goods Delivery by Using Simulated Annealing

Siti Hajar Mazlan & Wan Rohaizad Wan Ibrahim

Pickup and delivery services were widely used in business nowadays. This study is conducted with the purpose to solve a delivery services of gardenia bun to 7-Eleven around Johor Bahru. This traveling system is formulated as a Traveling Salesman Problem (TSP). TSP is the optimization problem that focuses on finding an optimal route for visiting places and going back to the point of origin. As a common problem, we have chosen a result that is a really simple combinatorial problem and we assumed it easily as the time taken or distance travelled by salesman visiting n locations cyclically. In this study, the delivery services lorry will go to each location of 7-Eleven for only once and will go back to the place where the lorry is starting (depot). This study is conducted by using a method of Simulated Annealing to find and gives the best route for the problem. The optimization problem for this study is generated through a software of Microsoft Visual C++ programming to solve the TSP.

Mathematical Modelling Of DNA Splicing System In Chorale Music

Siti Hawa Binti Mohamad Tawil & Dr. Fong Wan Heng

The splicing system is widely used in many types of fields including in chorale music. Thus, this research compares the splicing system, DNA and music, and then relates the modelling of DNA splicing system to chorale music splicing system. The importance of this research is to understand the relation of DNA splicing system to music which leads to the development of algorithmic music composition and biological environment with music composition. In particular, this research investigates on how the modelling of DNA splicing system influenced the modelling of chorale music splicing system. Firstly, the mechanical rebar splicing system is presented since it is one type of splicing system in construction fields. Music splicing system is given next to show the relation to the DNA splicing system. In chorale music splicing system, there are two approaches, namely note representation and tonality-degree representation. Both approaches are analysed to investigate the modelling of chorale music splicing system where the components of DNA splicing system are introduced differently for each approach. In short, the mathematical modelling of chorale music splicing system is a bio-inspired approach that increases the development of the automatic music composition.

A Study on the Economic Growth Contributed by Distributive Trade Sector

Siti Zulaikha bt Zulkefli & Dr. Haliza bt Abd Rahman

The Eleventh Malaysia Plan states that the distributive trade sector states that wholesale trade, retail trade and motor vehicle will be a major contributor to our country's economic growth. Wholesale trade is a business that sells certain goods, generally without any change, in large quantities as well as at low prices while retail trade is a kind of business that sells small quantities of goods. In addition, Automobil Nasional Berhad (PROTON) is one of the important steps that contributes to the development of the motor vehicle industry in Malaysia. In this study, two-way ANOVA methods will be used to identify the impact of the distributive trade sector on sales value, the relationship between the years with the total value of sales and also to identify the interactions between the distributive trade sector and the years being carried out on the sales values that represent the growth of our economy. This method is best suited when we want to compare the effects of multiple levels of two factors and we have multiple observations at each level. Hence, Durbin-Watson coefficient is used to test independence error by using studentized residuals. The *P-P* plot will visualised the normality of the variable's distribution and Levene's test is used to test the homogeneity of variances for k samples. Finally, Post-Hoc test will be used to examine which specific pair of group means shows significant differences.

Rayleigh-Benard Convection with Modulated Heating on Insulating Wall

Siti Nur Fadila Azmi & Ibrahim Mohd Jais

Rayleigh-Benard convection is a flow of heat from hot region to cold region in a porous media to form a cyclic flow which creates a convection was pioneered by Benard (1900). The earlier research conducted by Horton and Rogers (1945) and Lapwood (1948) on the onset of natural convection in horizontal porous media and continued by Nield and Bejan (1998) as discribed Horton-Rogers-Lapwood problem. The focus of this study is on numerical solution involving Darcy's law in a 1 by 2 rectangular cavity with the wall being insulated. The boundaries is set to have a temperature of $\cos \pi x \cos n\pi x$ with n taken as odd numbers where the structure have symmetrical line at $x = \frac{\pi}{4}$. According to Mojtabi and Rees (2011), natural convection in a horizontal porous layer heated from below by a uniform temperature is initiated when the Rayleigh number, $Ra = 4\pi^2$. Amplitude is taken the value $\varepsilon = \{0.1, 0.2, 0.3, 0.4, 0.5\}$ and $n = \{3, 5, 7, 9\}$. When Rayleigh number increase, the convection cell multiply accordance to ε and n .

Analytical Solution Of Laplace Equation Based On Grain Fumigation Problem

Syarifah Nur Ain bt Syd Badaruddin & Dr. Zaiton bt Mat Isa

In grain industry, the insect and mold can cause the infection which leads to the deteriorate in quality of the cereals. A chemical and non-chemical protectant has been introduced in order to kills and reduce the pest infestation. Phosphine is one of the gas that has been introduced in stored product protection where it is projected into the grain storage to eliminate the insect and pest. This thesis will investigates and analyse the behaviour of the phosphine gas in an open cylindrical silo during fumigation process. The flow of the phosphine gas was model as a gas flow in a porous media which statisfies Darcy's Law. This then leads o the contribution of Laplace Equation in solving the problem. The analytical solution for pressure and velocity of the gas flow was derived from the Laplace equation. The analysis on the gas flow was observed through the graph that has been obtained by using MATLAB. This thesis will analysed the open silo with 8 m high and 4 m width. It was found that, the velocity and pressure will decrease and approaching the atmospheric pressure as the height of the silo is increase.

School Bus Routing Problem

Wong Sing Wei & Dr. Rashidah Binti Ahmad

School Bus Routing Problem (SBRP) is a well-known problem in operational research where customers of known demands are supplied by one or several depots. The major task of SBRP is to transport the student from their homes to schools and vice versa more safely, economical and also convenient. The problem arises when vehicle must make a complete trip of disposal operation per day with minimum cost and distance travelled. We need to decide the best routes where school buses travelled shortly and carry large number of students. In this paper, an exact solution approach is described for solving a real life school bus routing problem (SBRP) for transporting the students to school through area around Taman Universiti, Johor Bahru. The problem is modelled as capacitated and distance constrained and associated with Mixed Integer Linear Programming (MILP). The objective is to minimize the number of school buses used and minimize total cost. A case study of SBRP involve 10 pick-up point in Taman Universiti, Johor Bahru is implemented and solves using LINGO 17.0. The optimal solution of the problem is computed using the proposed formulation. The computational result show that number of buses that service in the area is reduced when compare to the current practice.

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