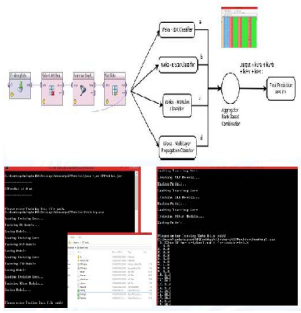
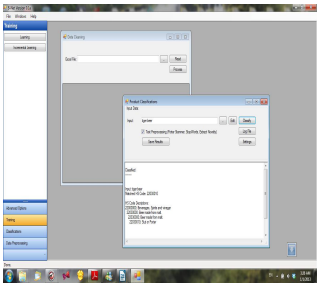
Intelligent System and Software Development



Telr Data Mining Challenge – Counterfeit Bank Notes Detector

- This Project is a Shortlisted Entry with 100% prediction accuracy for Telr Data Mining Challenge
- A system to detect counterfeit bank note based on its variance, skewness, curtosis, and entrophy attributes
- Multi Classifiers Combination strategy was implemented to leverage on each classifier strengths for fnal prediction decision through ranking method
- Four Classification algorithms was selected using Weka explorer and experimenter interface
- Conduct Analysis on data and prepare them using R, Weka and Rapidminer, while prediction Modeling and Evaluation was done using Rapidminer with Weka plugins.
- Excel was used for initial combination, while Java and Weka library was used to develop the final system and optimized for performance.

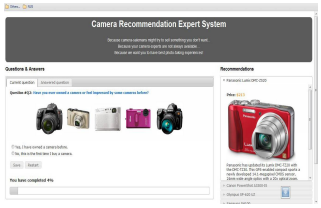
Technologies: Java, Weka, RapidMiner, R, and Rattle



SwiftMiner - NLP and Text Classification Approach for Unstructured Product Description Categorization

- An advanced text classification system to correctly categorize unstructured product descriptions input from customers into Singapore Custom HSCodes within ~1 seconds.
- Conducted Analysis ond Prediction Modeling on Big Data given by Singapore Custom
- Background Net Algorithm is used to learn from existing data and made accurate and fast product categorization, with incremental learning functionality
- Existing data is preprocessed using Auto Data Preprocessing and Auto Text Preprocessing approach developed using Rule Base System.
- NLP approaches is used to assist information retrieval from user unstructured text description before inputing to Background Net Classifier.

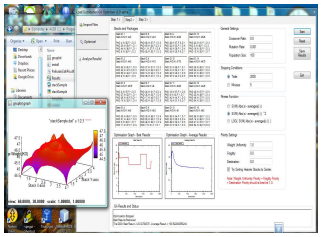
Technologies: Microsoft .Net Framework, WordNet, Tesseract for OCR and Q-Codes supports, Weka, Rapidminer, R, Rattle



Camera Esperto Recommendation Systems

- A knowledge based system to assist customers in selection of cameras based on a set of user criteria and preferences.
- Decisions is made using a sets of rules codified from expert knowledge, with uncertainty handling based on certainty factors accumulations.
- Decisions Rules in Rule Base is editable real time with the adminstration tools.

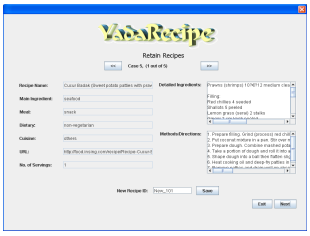
Technologies: ASP.NET, J-Query, MSSQL, CLIPS, and C# programming language.



GALDO – Genetic Algorithm for Load Distribution Optimisation

- An Intelligent System to search for an optimal arrangement of packages in containers to ease the process of loading and unloading.
- Arrangement is made by using Genetic Algorithms to search for the best optimal solution, with soft and hard constraints made based on center of gravity, package fragility and package unloading sequences.
- The system displays arrangement results in 3 dimensional plots for better visualizations.

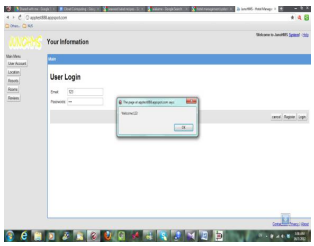
Technologies: Microsoft .Net Framework and Palisade Evolver Library.



YadaRecipe – User Centric Recipe Search System

- An Intelligent Recipe Query system that is able to retrieve recipes with ingredient quantities based on the number of servings and supports incremental learning of user selections
- The system made use of the Case Based Reasoning's Retrieve, Adapt and Reuse, Revise and Retain concepts to enhance the recipe search to be more user centric with the capability to continuously learn the user selection incrementally.
- The system also supports basic NLP information retrieval from unstructured user text input.

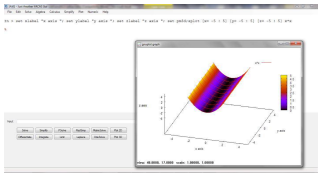
Technologies: Java and Jcolibri CBR library.



Juno HMS – Cloud Based Hotel Management System

- A Hotel Management System to provide customers with hotel booking and reservation services.
- The system made use of the ever evolving Cloud Technology to improve businesses by reducing overall expenditure, and removing the need for buying and maintaining a local server.

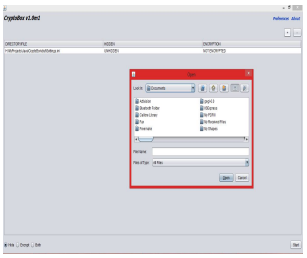
Technologies: JSP, Google Apps Engine with GWT leveraging on Google PaaS cloud services.



JAYG – Just Another YACAS GUI

- A Computer Algebra System with Natural Mathematical Display and user friendly interface.
- The system made use of YACAS computer algebra system, latex to image conversion, and HCI techniques to improve the usability and better visualisation of mathematical equation with natural mathematical display.

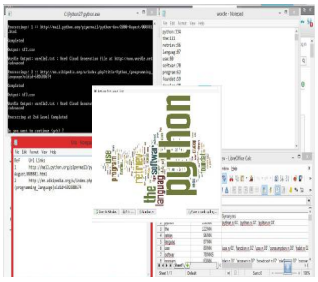
Technologies: Microsoft .Net Framework, YACAS and GNU Plot interfacing.



CryptoBox – Secure your files and folders in a few clicks

- A Folder Hiding and Encryption software with minimalist design for usability.
- The system support multi user creation and only the correct password from eah user can un-hide or decrypt the folder and files.
- Software support drag and drop interface, and allows folder hiding and encrypting with a single click of the mouse
- Secured AES Encryption on selected folders automatically encrypts every files and subfolders in it
- Hiding a selected folder assure each files and subfolders in within are hidden by altering their flag

Technologies: Java and Netbeans IDE



WebCloud– Word Cloud Generation from webpage

- A software that automatically extract textual content, two level deep, from input URL to generate word clouds using Wordle
- Software support crawling and extraction of 2 levels of web content based on input url.
- Extracted data are preprocessed using NLP approaches such as stopwords removal, punctuation removal, Porter Stemming, POS Tagging and Synonyms Extraction
- Processed Data are then generated into Wordle format for Word Cloud Generation
- The process from web extraction, preprocessing, and wordle generation are all automated and optimized for best performances

Technologies: Python, NLTK, and Wordle

Robotics and Engineering Product Design (Multi-Disciplines)

Mini-Shun – Autonomous Maze Exploring and Cans Flipping Mobile Robot

- An autonomous mobile robot capable of exploring an unfamiliar maze to flips all the cans within in less than 10 minutes.
- Modified Flood Fill Algorithm is used as the main algorithm to explore the whole maze.
- IR sensors are specially selected and positioned in a way that the robot is able to detect two lanes and will mark a low priority if the lanes contains no cans.
- Expert knowledge is codified into IF... THEN rules to assist the robot in making decisions based on the steps priority and maze walls arrangements.
- Reliable auto tuning algorithm for IR sensors are implemented to reduce the hassle of tuning when changing environment.
- Robot is designed using Hitachi H8 controller, and various IR sensors and servo motors.
- Robot clenched Second Runner-Up in All Japan Micromouse Competition 2007.

Technologies: C programming, Hitachi H8 Processor, and IronCad

Chameleon Helper – A Customer Service Improvement Device for Restaurants

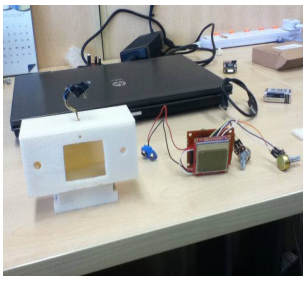
- A decorative device designed to signal waiters and staffs on the amount of time customers has waited.
- Device uses traffic lights colors convention for light signaling, with Red signify longest waiting time, and Green signify least waiting time.
- Device uses LDR instead of button to start and reset to prevent children from interfaring the device performance unintentionally.
- Device is easy to build, customise and more importantly, cost effective and decorable on dining tables.
- Device is developed simple parallel circuits, LEDs, LDR and PIC16F84 controller.
- Invention has won the Tan Kah Kee Young Inventors' Merit Award in 2007.

Technologies: C Programming and PIC16F84 processor

Low Cost Pneumatic Sensors

- A set of cost effective sensors to measure air flow speed and power, in appealing to the NFPA Technology RoadMap for fluid power industry.
- A set of sensors design has been derived, namely flexiforce sensor in soda bottle to measure static pressure, LVDT built into pneumatic actuator, Sound sensor attached onto pneumatic actuator and valve, pitot tube in actuator, and flowrate meter based on vane and optical sensor.
- Sensors are designed to be cost effective and ideally, from recyclable materials, but without sacrificing too much on performance for normal usage.
- Sensors are designed using solidworks, rapid prototyping techniques and tested using Arduino controller interfacing with PC and specially developed application using .Net Framework

Technologies: C Programming, Arduino, Autodesk Inventor, Solidworks, 3D printer



Cost Effective Medical Intravenous (IV) Monitoring Device

- A cost effective medical IV drip monitoring device for emergency situation where medical equipment is insufficient or for use in developing countries.
- Device has to be cost effective with sacrificing performance for normal usage.
- Device is developed using strain guage sensors and Arduino controller to measures the weight of drip package and alarms when the weight fall to a certain threshold.
- Special C# application has been developed for visual monitoring and wireless interfacing, through Zigbee.
- Device are designed using solidworks and rapid prototyping techniques.

Technologies: C Programming, Arduino, Autodesk Inventor, Solidworks, 3D printer

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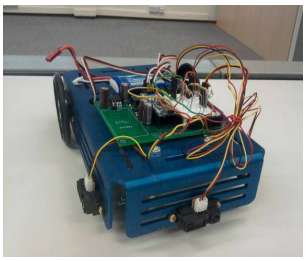

Obstacle Avoidance Robot with Path Planning using Wireless Sensors Networks

- The objective of this project is to evaluate on the Arduino Carrier Board created by MIT graduate students Shane Colton, by exploiting and testing the functionality, and provide valuable feedbacks for improvements.
- A development of board into an obstacle avoidance robotic car with bluetooth and Zigbee interfacing with C# application has been the initial results.
- Further exploiting includes the inclusion of wireless sensors network for motion planning based on the location and coordinates provided by the sensors.
- The robotic car is later used for showcases in various SUTD events.

Technologies: C# Programming for Winform remote interfacing, C Programming, Arduino

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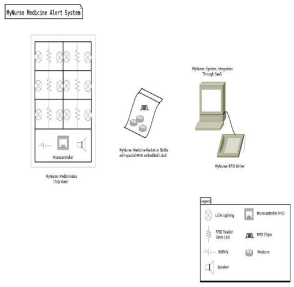
Remote Control Plasma Car

- The plasma car is powered by a single servo motor and is controllable using a wireless interfacing controller.
- The objective of this project is to educate Junior College exchange students on using Solidworks to design the plasma car, rapid prototyping using 3D printer, and basic electronics and microcontroller interfacing using Arduino controller.
- The project has been completed on time, and the programme has received positive feedbacks from the students.
- The plasma car is later modified for showcases in the SUTD Women Forum Event.

Technologies: Autodesk Inventor, Solidworks, 3D printer

Researches, Case Studies, and Proposals



MyNurse: Cost-Effective Medicine Alert System (Winner of YEA-ESSEC Business Plan Competition)

- MyNurse is a Medicine Alert System designed for affordability and usability, catering one of the ageing population challenges
- Aging population is a global issue and elderly forgeting to consume medicine on time are adverse and fatal cases
- System consist of medicine box, rfid designed medincine label, rfid writer and MyNurse System (SaaS) for easy system integration to hospital and clinics system
- Elderly first checkout from clinic with hospital staffs downloading medicine consumption timing to medicine label.
- MedicineBox will alert elderly during consumption time, and more importantly, only the slot containing medicine to be consumed will have LEDs lighting
- MedicineBox is open model to foster user innovation, as well as we accept user customizablility and feature add-on such as sms alert

Technologies: Predicted to be C programming, Microsoft .Net Framework, Cloud Computing, RFID and etc.

- Eric Goh. *Singapore University of Technology and Design – The Rise of Singapore's Fourth University.* MBA Final Project presented to the U21Global and IGNOU committees. January 16, 2011.WebEX.
- Eric Goh. *Upgrading of Business Systems: Convergence and Standardizing of ERP System*. Presented to U21Global and IGNOU Committees. September 10, 2010. WebEX.
- Eric Goh. *Future Challenges of DSpace at the InterContinental Hotels Groups*. Presented to U21Global and IGNOU Committees. May 20, 2010. WebEX.