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EDUCATION

Master of Industrial Engineering, National Taiwan University (NTU)   *2021/02～2023/02*

- **Master Thesis - Supervised and Unsupervised Encoding Schemes of Binary Variables for Prediction Performance Enhancement:**

  Developing a variable encoding framework for binary features can be used as a dimensionality reduction method for high-dimensional data and simultaneously improve the predictive effectiveness of classification tasks in classification models.

- **Coursework:**
  - **Methods and Operations:** Data Analytic, Soft Computing Methods and Applications, Discrete-Event Simulation and Implementation.
  - **Engineering and Management Applications:** Introduction to Statistical Control and Optimization, Time Series Analytics, Semiconductor Intelligent Manufacturing Systems.
  - **Optimization and Fundamentals:** Linear Algebra and Its Applications.

- **Seminar - Asia Pacific Industrial Engineering and Management Society:**

  The proposed encoding method can be applied to high-dimensional binary data commonly found in manufacturing industries, which can effectively visualize the high-dimensional data and improve the prediction performance in the classification model.

Bachelor of Industrial Engineering and Engineering Management,   *2016/09～2021/02*
National Tsing Hua University (NTHU)

- **Undergraduate Senior Project – Visualized Decision Support Systems for Weaving:**

  In response to the digital transformation of the traditional industry, after consulting and clarifying the problems and current situation of the factory, the manufacturing decision support system (electronic signage, machine monitoring system, and defect loss analysis system) is constructed to implement flexible decision making to realize Industry 3.5 and intelligent manufacturing.

- **Coursework:**
  - **Industrial Engineering:** Operation Research, Production Planning and Control, Quality Control.
  - **Economics:** Engineering Economics, Engineering Statistics, Principle of Economics, Probability Theory.
  - **Computer Science:** Discrete Mathematics, Data Structure, Linear Algebra, Product Design and Development.

- **Seminar -International Conference on Intelligent Production and Operations:**

  Developing a greedy method-based heuristic algorithm to solve the resource scheduling problem of a complex flexible manufacturing system (FMS) considering material handling, compared with the randomized method and genetic algorithm; compared with the genetic algorithm proposed in the benchmark paper, it shortened the minimum completion time by 28%; and won the best paper award.

WORK EXPERIENCE

Taiwan Semiconductor Manufacturing Company, Ltd. (TSMC)   *2021/08～2021/09*

✓ **Computer Integrated Manufacturing Engineer (CIM Engineer)**   Central Taiwan Science Park., Taichung

- **Automated acquisition of etching data with RPA:**
  - o **Description:** Building RPA program with UI path and executed online. The data of the etching machine is obtained and uploaded to the server, and then the Docker command is called to serialize the back-end prediction program for execution.
  - o **Result:** Parallel processing with R languages in series reduces overall program execution cycle time by 35%, reduces machine data omissions, and provides parameter customization for horizontal deployment to other plants.
  - o **Related Skills:** Visual Basic, R, Docker, JSON

Everest Textile Co., Ltd.   *2019/08～2019/09*

✓ **Intelligent Manufacturing Consultant**   Shanshang Dist., Tainan

Visualized Decision Support System for Weaving Production:
  - o **Description:** Constructing a data visualization program as an electronic viewing board in the factory to monitor the status of 375 various looms in real-time, as well as a product history yield rate analysis system to provide raw material management for material input quantity evaluation and to help distinguish the responsibility of defective products.
  - o **Result:** Save 5% of feeding cost, warning of machine abnormalities, and shorten 60% of inspection time by presenting real-time machine conditions on electronic viewing boards.
  - o **Related Skills:** C#, Python, SQL

SKILLS

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Industrial Engineering	Quality Management, Production Management, Operation Research.
Computer Science	Data Analytic, Machine Learning, Algorithm.
Programming Skills	C#, Python (pandas, numpy, sklearn, plotly), SQL, Swift, Visual Basic.
Certification	TOEFL iBT: 91, EMT-1.
Languages	Mandarin, English.

REMARKS AND APPENDIX
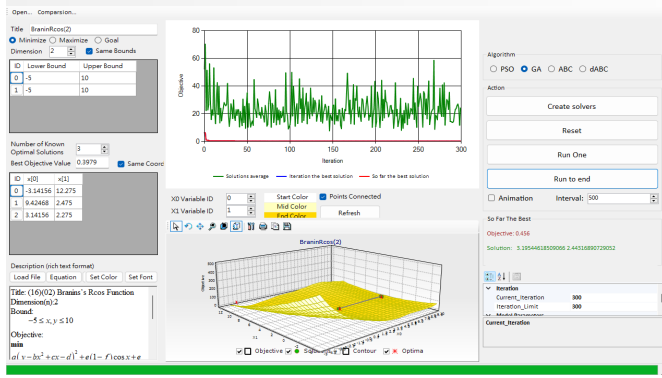
▲Solving Benchmark Problems with Algorithms:

For the benchmark problem, different algorithms (genetic algorithm, particle swarm algorithm, bee swarm algorithm, etc.) are used to evaluate the characteristics of each algorithm in searching for the best solution.

Related Skills: Algorithms, Optimization.
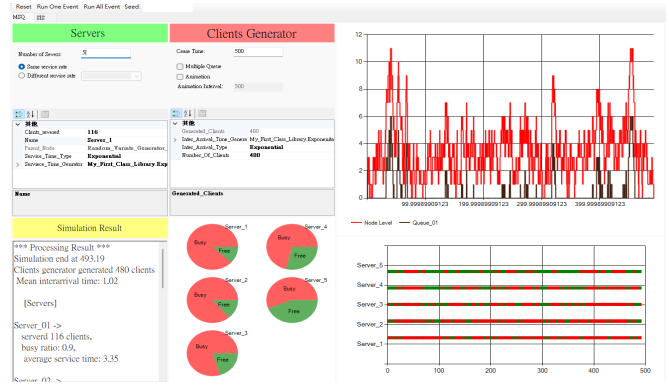
▲Manufacturing System Simulation:

A manufacturing system with multiple unequal machines is simulated, where products arrive at irregular intervals and enter the queue to wait for service. The maximum number of WIP in the row and the operating rate of each machine in the system are observed.

Related Skills: Queueing Theory, Manufacturing System.

▲Real-Time Machine Monitoring System (Schematic):

Presenting 375 real-time loom machines in 6 zones and summarizes the reasons for downtime in different colors so that field personnel can quickly investigate and repair them; it is also used to search for corresponding work order numbers; and actively notifies machines that stopped for too long.

Related Skills: C#, SQL, Data Visualization.
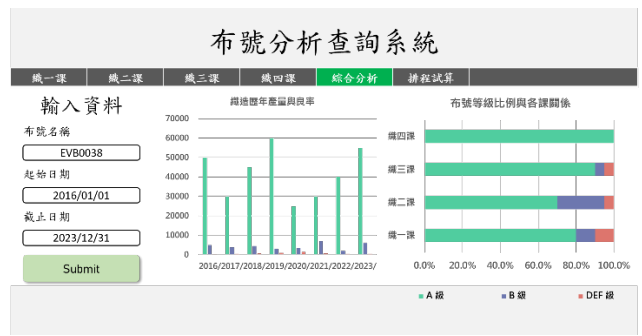
▲Product Defect Loss Analysis System (Schematic):

A web-packaged user interface that reads historical data and presents the historical yield rate and the total number of orders for a specific product under each category so that it can be used as a reference for quality control staff to distinguish responsibility for defective products or as a raw material input for production control.

Related Skills: Python, Quality Management, Production Management.
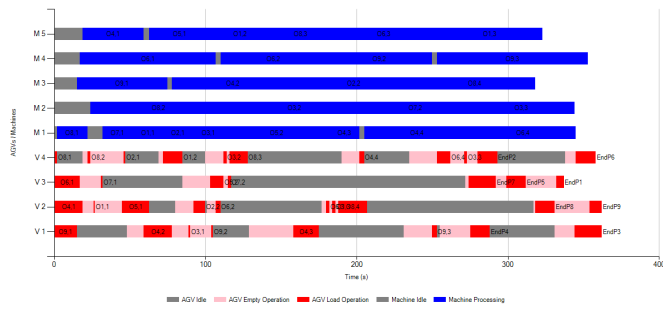
▲**Flexible Job Shop Scheduling Considering Material Handling:**

Construct a scheduling system that considers the material handling of the WIP. The scheduling should consider the dispatch of transportation equipment and transportation distances to achieve a more reasonable and practical minimum completion time.

Related Skills: Job Shop Scheduling, Heuristic Algorithm, Martial Handling System
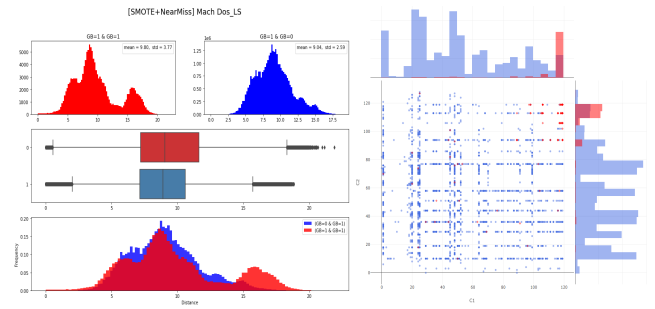
▲**Quantitative Analysis Under Data Imbalance Scenarios:**

Try distinguishing the highly unbalanced ratio of good and defective data in the manufacturing industry and improving the model's predictive performance through various data pre-processing methods.

Related Skills: Machine Learning, Data Pre-processing, Imbalence Data