Chengyuan Yang

Tel: (65) 8124-6225, Email: CYANG027@ntu.edu.sg
#11-99, 693 Jurong West Central 1, Singapore 640693.

EDUCATION BACKGROUND

Nanyang Technological University **Singapore**
Master Of Science ***2024.08 Till Now***

- **Major:** Mechanical Engineering
- **School:** School of Mechanical and Aerospace Engineering

South China University of Technology(SCUT) **China**
China Bachelors Degree awarded in June 2024 ***2020.09-2024.06***

- **Major:** Mechanical Engineering
- **School:** School of Mechanical and Automotive Engineering
- **GPA:** 3.3/4.0
- **Major Courses:** *Theory of Machines and MechanismFundamentals of Control Engineering, Principle & Application of Single Chip Microcomputer, Engineering Thermodynamics, Measurement Technology & Signal Processing, Electrical Engineering and Electronics, Digital Image Processing & Application, etc.*
- **Exchange Experience:** Data Science Project, UCLA (Remote) ***2023.03-2023.06***

Jiujiang No. 1 High School **China**
2017.09-2020.06

- **Gaokao:** *Chinses, Mathematics, English, Physics, Chemistry, Biology.*
- **Score:** 629/750

RESEARCH & COMPETITION

Project Leader, Graduation Design: Component Pin Distance Adjustment Prediction Model ***2023.03-2024.01***
Based on Machine Vision and Self-Learning

- Conducted research on a component pin distance adjustment prediction model based on machine vision and self-learning, aimed at improving accuracy in electronic assembly processes
- Designed and implemented a binocular stereo vision system using Python for high-precision pin detection and distance measurement, including image preprocessing, feature point matching, and 3D reconstruction, enhancing pin feature extraction robustness through Hough transform and feature point matching
- Developed a polynomial-based prediction function for electronic component pin distance through nonlinear fitting of experimental data, performing extensive experiments and data analysis to accurately reflect the relationship between expected and actual adjustment values
- Established a reinforcement learning model using MATLAB, employing Q-learning and Deep Q-Network (DQN) algorithms to optimize pin distance adjustment strategies through ε-greedy, SoftMax, and Thompson Sampling approaches
- Independently modeled and designed the experimental platform, including fixtures and an adjustment platform, conducting systematic verification with results demonstrating high precision and efficiency

Team Member, College Student Innovation and Entrepreneurship Training Program: Design of ***2022.08-2023.06***
Home-Based Elderly Care System Based on IoT Flexible Display Technology

- Intended to create a unified elderly care tracking system that utilized clothing to monitor the heart health of seniors and showcase real-time info on the garment through an IoT platform in a mini-app.
- Connected a sensing carrier, fitted transmission lines, and multiple lead electrodes to permit the chip to record the patients electrocardiogram signals.
- Sent the chips data to the IoT platform via an integrated circuit terminal linked to a WIFI module and an external network and presented the information on a flexible display screen.
- Adopted an STM32 microcontroller as the core, integrating power, crystal oscillator, keypad, display, data acquisition, etc., into a compact design.
- Employed LM2576T-5 chip and AMS1117-3.3_C369933 chip for voltage reduction and wide voltage output.
- Designed the main control part, including system reset, external crystal oscillator circuit, debugging interface, and flash memory chip.
- Received the first prize, obtained provincial-level recognition, and granted a utility model patent.

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Team Member, Student Research Project (SRP) - FSAE Race Car Dynamics Simulation Based on VI-grade ***2022.03-2023.03***

- Leveraged VI-grade simulation software and knowledge of automotive theory and automatic control to maximize the vehicle parameters of the project team.
- Adopted differential evolution algorithm to obtain initial tire data and iteratively optimized it in MATLAB.
- Generated the PAC.2022 tire attribute file after parameter optimization for Adams vehicle simulation analysis.
- Completed hardpoint modeling in CATIA following obtaining of the tire alignment parameters, completed single system simulations such as suspension K&C characteristic simulation, and dealt with steering characteristic curve simulation, vehicle lap simulation, and post-processing.
- Integrated parameters from each system member in the project team and conducted full vehicle simulation testing.
- Accomplished the project with university-level recognition.

Technical Team Member (Steering System Lead) & Quality Control Department Director, Formula Student China (FAC) ***2022.10***

- Aimed to develop a steering system that satisfied the competition requirements for driverless cars.
- Participated in static testing on the race track and delivered technical defense to competition judges.
- Charged with project declaration and patent management within the team.
- Engineered the steering system in coordination with the suspension and vehicle data through Adams regarding the previous race car running parameters and implemented Catia for modeling; executed dynamic simulations with Ansys Work bench and performed structural verification and adjustments; applied AutoCAD to create drawings for manufacturing components and conducted on-vehicle testing and chassis tuning after obtaining the subsystem parts.
- Analyzed tire data, fitted torque parameters, and established three-dimensional hardpoint coordinates, employed VI-grade simulation to find the optimal Ackermann rate, and detected the best Ackermann percentage for each circumstance.
- Created a human/unmanned switching device and used electromagnetic clutches and transmission mechanisms in conjunction with the electronic control unit (ECU) to control the steering system.
- Won the First Prize at the FSC.

INTERN EXPERIENCE

Intern, Manufacturing Department, Donggeng Loong-Gine Power Co., Ltd. ***2023.08-2023.09***

- Learned manufacturing processes such as body workshop, mechanical workshop and shaft workshop through hands-on training and study of real-world mechanical engineering problems.
- Assisted production engineers by reviewing process documentation, identifying and resolving issues, and writing production reports to understand production standards and principles of mechanical engineering management.
- Recorded production data and quality metrics, conducted data analysis to support production process analysis and evaluation of production efficiency and quality.

Assistant Researcher, Research Department, Guangdong Changnengda Technology Development Co., Ltd. ***2022.06-2022.12***

- Involved in creating ultra-thin phase change devices and dismantling and reassembling motors.
- Modified and simplified models with SolidWorks based on simulation requirements.
- Applied ANSYS to implement structural analysis of the inner components of phase change devices to assess the stress distribution and completed basic parameter optimization for geometric measurements.
- Focused on creating and building the racing chassis, synergizing the structural design and thermal simulation with the transmission and power systems.
- Performed thermal simulations of the circuit board and battery pack with Icepak.
- Supported the teams graduate students in completing the company's horizontal business research.

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STUDENT WORK

Assistant, Innovation and Entrepreneurship Office, SCUT ***2022.03-2022.09***

- Assisted teachers in organizing various competitions and activities.
- Aided in the 2022 Special Creative Integration Teacher Training Camp at SCUT.

Member, Contact and Development Department, Student Union, School of Mechanical & Automotive Engineering ***2020.10-2021.11***

- Managed the student organization team, including selecting and appointing members and officials, allocating duties, assessing performance, and instituting an exit system.
- Executed data analysis and growth needs surveys to supply reference data for skill advancement plans.
- Formulated growth plans and training programs for student leaders and instituted internal work systems within various departments.

PUBLICATION & PATENT

- First Author, **An Estimation of the Pricing of Second-Hand Sailboats Based on the Random Forest Algorithm**,MSEA, 04/2023 Accepted by EAI in July 2023 Submission URL: http://dx.doi.org/10.4108/eai.26-5-2023.2334481
- Fifth Inventor, **A Heart Monitoring Shirt Based on IoT and Flexible Display Technology** (Patent Number: CN219578897U), 04/2023
- Sixth Inventor, **A Conical Gear Backlash Control Structure** (Patent Number: CN218440584U), 02/2023

HONORS & AWARDS

MAE Graduate Study Grant – Master of Science in Mechanical Engineering, NTU ***2024.06***
Second-class Scholarship of SCUT ***2023.10***
Third Prize in the Mathematical Contest in Modeling (MCM) ***2023.07***
National First Prize of Formula Student Autonomous China (FSAC) ***2022.09***
Second Prize in the Preliminary Round of the "Young Cup" Business English Competition ***2022.05***
Third Prize in the "Jingong Cup" Competition by the Engineering Training Center ***2022.03***
Honorable Mention in the Greater Bay Area Cup Guangdong-Hong Kong-Macau Financial Mathematics Modeling Competition ***2021.12***

LANGUAGE & SKILLS

- **English:** IELTS: 7.0 (L: 8.0; R: 7.0; S: 6.5; W: 6.0);
  GRE: 331+3.5 (VR:161; QR:170; AW:3.5)
- **Computer:** C++, SPSS, Matlab, Solid Works, CATIA, Python, Adams, Auto CAD, Ansys Workbench, Electronic Design Automation, Altium Designer (JLCPCB), VI-grade, Power point, Word, Excel.

INTEREST

Soccer, Badminton, Swimming, Photography, Skateboarding, Video Production and Movie Industry