



Qian Sun

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Technische Universität Bergakademie Freiberg Master of Science
1991 September China • Shandong

Automotive Manufacturing (Materials and Components) graduate student with solid foundation in vehicle engineering, mechanics, materials science, vibration science and embedded system, good at structural modeling, finite element analysis, modal analysis and embedded system design, proficient in programming and modeling of Matlab and Simulink, and ANSYS, proficient in Linux, Git, LaTeX, Office and other common platforms and tools. With more than 4 years of study experience in Germany, excellent communication skills in German, excellent master's performance in school, active practice of scientific exploration spirit, and actively participate in a number of projects and competitions.

Education

09.2010	School of Mechanical and Automotive Engineering, Liaocheng University
07.2014	Bachelor in Automotive Engineering
10.2016	Faculty 5 - Materials Science and Technology, Technische Universität Bergakademie Freiberg
07.2020	Master in Automotive Construction: Materials and Components

Personal Projects

- **Research on Embedded Control System:** https://github.com/sq43793911/Balance_Car
 - a) **Freescall Smart-Car Cup:** A two-wheeled balancing car designed and manufactured based on the requirements of Freescall Smart Car Cup, with automatic track identification and control functions. The control system is based on the Freescall S12X microcontroller and uses electromagnetic induction principle to identify the track. Learned the basic principle of embedded system design and the realization method of common control algorithm, and had a deeper understanding of the practical application of microcontroller.
 - b) **Bachelor-Thesis:** The Freescall K60 MCU is used as the control core and the CCD camera as the acquisition device. Based on the previous study, the redesigned and manufactured two-wheel balancing vehicle can identify the route or track by analyzing the camera information. The working principle and application method of 32-bit controller and the image acquisition and analysis method of CCD camera are studied and studied deeply.
- **Intelligent algorithm research project:** <https://github.com/sq43793911/Intelligent-Algorithms>
 - a) **Matlab modeling algorithm:** Using Matlab to make 4 kinds of common intelligent optimization algorithms (genetic and ant colony optimization, immune, tabu table) modeling, and the traveling salesman problem solving respectively, to study the basic principle of the intelligent optimization algorithms and mathematical modeling method, compares the advantages and disadvantages of various algorithms and application value, convenient accordingly after choice of the algorithm.
 - b) **Matlab genetic algorithm modeling:** Based on the theory of economic batch model, optimized the warehouse cost management of the factory by using genetic algorithm, and independently completed the theoretical analysis and mathematical modeling of the whole system, as well as the compilation of all the codes in MATLAB.
 - c) **Deep learning:** Based on classified learning toolbox of MATLAB, studied and practiced the algorithms of KNN (K-nearest neighbor classification algorithm) and cluster analysis which commonly used in data mining, and learned the basic principles and methods of neural network.
- **Master Thesis:** https://github.com/sq43793911/Masterarbeit_public
Experimental and Simulation Modal Analysis of Milling Tool Shank Based on Eccentric Error in High Speed Cutting. The modal analysis of bending vibration of milling tool shank in high speed cutting is carried out, and the effect of eccentricity error on the natural frequency of the structure is analyzed. By learning the basic method of nonlinear finite element, an effective method for modal analysis of high-speed moving objects was proposed, and the modeling of modal analysis of nonlinear finite element was completed independently, and the experimental research method of modal analysis and the use of commonly used experimental software were also learned. To undertake all the tasks, the simulation model was constructed by using Matlab and compared with ANSYS results. SolidWorks was used to draw the experimental parts, and Pulse Labshop and Me 'Scopeves were used to measure and analyze the experiment.
- **Project Paper:** https://github.com/sq43793911/Projektarbeit_public
Modal analysis based on finite element method. Through this project, I learned the mathematical modeling method of finite element and the method of modal analysis, as well as the application method of ANSYS. Undertake all the tasks, using Matlab and ANSYS to carry out modal analysis of the axial and bending vibration of the rod, as well as the bending vibration of the plate, and generate the mode shape.

Internships

August 2015	After-sales service @ Shandong Luhua Automobile Sales Co., Ltd
August 2016	► Trainee in after-sales service, participated in fault troubleshooting, repair and technical analysis, and was responsible for processing, input and filing of relevant after-sale information of vehicles, which improved the understanding and understanding of various systems of automobiles, skillfully used office software such as WORD and EXCEL, and got familiar with the basic process and fault troubleshooting methods of after-sale automobiles.

Competences & Languages

Area of expertise	New-energy vehicles, FEM, Modalanalysis, Light-weight manufacture, MCU-System
Programming	Matlab, Mathematica, C++
Tools	Ansys, Solidworks, Git, LaTeX, Office, Freescall CodeWarrior, IAR Embedded Workbench
Languages	Germany – Negotiation; English – Mastery(CET-4)