DELIN ZHAO

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EDUCATION

Xi'an Jiaotong University (985) **Xi'an, China**
M.E. of Electrical Engineering *Sept. 2020 - Present*
Average score: **90.75**/100 GPA: **3.69**/4.0 Ranking: **2**/42
Main courses: Electrical Network Theory (100), Computational Method A (92), Academic English II (93), Design of Power Electronic Equipment (Excellence), Principles and Application of DSP controller (Excellence), Skills Training for Power Electronic Technology (Excellence)

Jilin University (985) **Changchun, China**
B.E. of Electrical Engineering and its Automation *Sept. 2016 - June 2020*
B.A. of English Literature (double bachelor's degree) *Sept. 2018 - June 2020*
Average score: **89.07**/100 GPA: **3.58**/4.0 Ranking: **4**/101
Main courses: Probability and Statistics B (97), Computing Method B (96), Practice: Programmable Logic System Design (94), Signal and Systems A(*bilingual*, 95), Power Electronics Technology (95), Continous and Discrete Control Systems (92), Microcomputer Principle and Interface Technology A(*bilingual*, 94), Power System Analysis (93)

RESEARCH EXPERIENCES

Development of 22kW 800V Bidirectional On-board Charger *Nov. 2021 - Present*
United Automotive Electronic Systems Co., Ltd. (UAES, Shanghai)

• The on-board charger (OBC) is **compatible with 6.6kW for single-phase and 22kW for three-phase**, requiring bidirectional power flow to meet the needs of different scenarios.
• In previous work, the advantages and disadvantages of different topologies were investigated and analyzed. Among them, CLLLC resonant converter is chosen as the DC-DC stage topology.
• The key point is to achieve **wide voltage gain**, and to reduce the DC bus capacitance in consideration of improving the overall power density and efficiency of OBC by means of active power decoupling, sinusoidal charging, etc. Besides, the bidirectional functions such as vehicle-to-load (**V2L**) and vehicle-to-grid (**V2G**) are also required.

Modeling and Stability Analysis of Wireless Power Transfer (WPT) System *Sep. 2020 - Nov. 2021*

• **Modeling:** In previous work, various models of LCC-S type wireless power transfer system have been established, including GSSA, EDF, discrete-time modeling, and harmonic state space (HSS).
• **Stability analysis:** In the discrete iterative model, the eigenroots of the Jacobian matrix at the fixed point are used to analyze the system stability. Converting the GSSA and EDF closed-loop transfer functions to the z domain, we can explore the influence of different controller parameters (K_p, K_i), delay parameters (hardware delay, controller delay), and hardware parameters (mutual inductance, load) on system stability in comparison with discrete iterative model. In HSS model, the system stability and the oscillation frequency can be analyzed by eigenvalues.
• **Periodic energy control (PEC):** The periodic energy control takes the energy input to the resonant network in each period as the control target, which has the advantages of fast dynamic response and suppression of system overshoot.

RESEARCH PUBLICATION

[1] T. Ma, Y. Wang, X. Hu, **D. Zhao**, Y. Jiang and C. Jiang, "Periodic Energy Control for Wireless Power Transfer System," in IEEE Transactions on Power Electronics, vol. 37, no. 4, pp. 3775-3780, April 2022, doi: 10.1109/TPEL.2021.3129501.

[2] Hu Xiufang, Wang Yue, Lv Shuangqing, **Zhao Delin**, Ma Tianlu. Modeling and Stability Analysis of Wireless Power Transfer System Based on Harmonic State Space [J/OL]. Automation of Electric Power Systems: 1-17, 2022.3, doi: 10.7500/AEPS20210724005

[3] Hu Xiufang, Wang Yue, Lv Shuangqing, **Zhao Delin**, Ma Tianlu. Modeling and Stability Analysis of LCC-S Wireless Power Transfer System Based on Activation Function [J/OL]. Transactions of China Electrotechnical Society: 1-11, 2022.3, doi: 10.19595/i.cnki.1000-6753.tces.211722

[4] Wang Yue, Ma Tianlu, Hu Xiufang, Lin Zijie, Zhao Delin. A Periodic Energy Control Method for Wireless Power Transmission System [P]. Shaanxi Province: CN113517763A, 2021-10-19.

COMPETENCES AND SKILLS

- Languages: IELTS: 6.5, GRE: 325 (V:155 Q:170 AW:3.0)
- Computer Skills: Proficient in MATLAB, Altium Designer, Code Composer Studio (CCS), Quartus II, Keil, PSIM, Cadence PSpice, Simetrix/Simplis and other science softwares

HONORS AND SCHOLARSHIPS

Honors:

- Xi'an Jiaotong University **Excellent Postgraduate** during the academic year of 2021-2022 Oct. 2022
- Xi'an Jiaotong University **Excellent Postgraduate Cadre** during the academic year of 2020-2021 Dec. 2021
- **Excellent Postgraduate** of Power Electronics and Renewable Energy Center(PEREC) during the year of 2021 Nov. 2021
- Outstanding Volunteer of Xi'an Jiaotong University Power Electronics Academic Annual Conference June 2021
- Jilin University **Excellent Graduation Thesis (Design)** June 2020
- **Excellent League Member** of Jilin University May 2019
- Jilin University **Excellent Student** during the academic year of 2018-2019 (*Ranking:**3/101***) Nov. 2019
- Jilin University **Excellent Student** during the academic year of 2017-2018 (*Ranking:**3/101***) Nov. 2018

Scholarships:

- **Special Scholarship** of Xi'an Jiaotong University during the academic year of 2021-2022 Oct. 2022
- **Special Scholarship** of Xi'an Jiaotong University during the academic year of 2020-2021 Nov. 2021
- **Delta Scholarship** during the year of 2021 (only **6 people** in the whole college) Nov. 2021
- Jilin University **Graduate Scholarship** June 2020
- **National Encouragement scholarship** during the academic year of 2018-2019 Nov. 2019
- Jilin University **Xinwang First Prize Scholarship** (only **3 people** in the whole school) (*Ranking:**1/101***) Dec. 2018
- Jilin University **Academic Achievement Scholarship** for Disciplinary Competition (**3 times**) May 2018- Nov. 2018
- **National Encouragement scholarship** during the academic year of 2017-2018 Nov. 2018

COMPETITION EXPERIENCES

• National Undergraduate Electronic Design Contest in Jilin Division	Second Prize	Dec. 2019
• 10^{th} Electronic Design Competition of Jilin University	**First Prize**	May 2019
• Jilin Province Undergraduate Electronic Design Competition	**First Prize**	Oct. 2018
• 3^{rd} Jilin Province Robot Competition	**First Prize**	Sep. 2018
• National Robot Competition	Second Prize	Aug. 2018
• Infineon National University UAV Innovative Design and Application Competition	Top 15	July 2018
• 9^{th} Electronic Design Competition of Jilin University	**First Prize**	May 2018
• 2^{nd} Jilin Province Robot Competition	**First Prize**	Nov. 2017
• National College Students Mathematics Competition in Jilin Division	Third Prize	June 2017

EXTRA-CIRRUCULAR

Student working experience:

- S0048 party branch disciplinary member, School of Electrical Engineering Sep. 2020 - Present
- Director of news media center of School of Electrical Engineering, Xi'an Jiaotong University Sep. 2021 - July 2022

Voluntary service:

- Volunteer of the anti-epidemic vanguard team, School of Electrical Engineering Dec. 2021 - Feb. 2022
- Filming of the unveiling ceremony of China Electric Power Technology Innovation Alliance Sep. 2020