

# Ziyou Song

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## BASIC INFORMATION

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**Gender** Male  
**Birth** 6/2/1989  
**Hometown** Tianjin

## EDUCATION

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**Tsinghua Univ.** **Doctor** **Power Engineering and Engineering Thermophysics** **2011.10 – 2016.07**

- GPA: 91.8/100, Ranked 7<sup>th</sup> of 88

**Tsinghua Univ.** **Bachelor** **Automotive Engineering** **2007.09 – 2011.07**

- GPA: 89.8/100, Ranked 6<sup>th</sup> of 89

## RESEARCH EXPERIENCE

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**Motor Control, New Configuration of Energy Storage** **Research Interests during Ph.D** **2011.10 – Now**

- **Completed:** Fault diagnosis and fault-tolerant control of Hall sensors used in PMSM. Rotor phase estimation of sensorless PMSM
- **Completed:** Dynamics simulation combining the in-wheel motor and the tire
- **Completed:** Optimization and control of Hybrid Energy Storage System (battery+ultracapacitor) used in vehicle areas
- **In progress:** Dynamic control of four-wheel drive electric vehicle

**Control optimization of a PMSM used in EVs** **Bachelor Dissertation** **2011.03– 2011.07**

- **Completed:** Hardware and software design of the PMSM controller which realizes the FOC (Field Oriented Control) algorithm, dead-time compensation algorithm and regenerative braking algorithm

## PUBLICATION

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- **Song Ziyou**, Li Jianqiu, Ouyang Minggao, et al. A Comparison of Phase Estimation between Hall Sensors and Sliding Mode Observer[C] // Proceedings of the 2nd International Conference on Electronic and Mechanical Engineering and Information Technology (EMEIT 2012), Shenyang, Liaoning, China, 2012: 1737-1745. (**EI 20125215828866**)
  - **Song Ziyou**, Li Jianqiu, Ouyang Minggao, et al. Sensorless Control of PMSM with Compensated Sliding Mode Observer[C] // 2012 International Conference on Measurement, Instrumentation and Automation (ICMIA 2012), Guangzhou, Guangdong, China, 2012: 1226-1233. (**EI 20130515973501**)
  - **Song Ziyou**, Li Jianqiu, Xu Liangfei, et al. Traction Control System for EV Based on Modified Maximum Transmissible Torque Estimation[C] // 2013 9th IEEE Vehicle Power and Propulsion Conference (VPPC 2013), Beijing, China, 2013: 384-390. (**EI 20140717296501**)
  - **Song Ziyou**, Li Jianqiu, Ouyang Minggao, et al. Rule-based Fault Diagnosis of Hall Sensors and Fault-tolerant Control of PMSM[J]. Chinese Journal of Mechanical Engineering, 2013, 26(4): 813-822 (**SCI, IF: 0.598**)
  - **Song Ziyou**, Heath Hofmann, Li Jianqiu, et al. Energy Management Strategies Comparison for Electric Vehicles with Hybrid Energy Storage System[J]. Applied Energy, 2014, 134: 321-331 (**SCI, IF: 5.613**)
  - **Song Ziyou**, Li Jianqiu, Han Xuebing, et al. Multi-objective Optimization of A Semi-active Battery/Supercapacitor Energy Storage System for Electric Vehicles[J]. Applied Energy, 2014, 135: 212-224 (**SCI, IF: 5.613**)
  - Li Jianqiu, **Song Ziyou**, Wei Yintao, et al. Influence of Tire Dynamics on Slip Ratio Estimation of Independent Driving Wheel System[J]. Chinese Journal of Mechanical Engineering, 2014, 27(6): 1203-1210 (**SCI, IF: 0.598**)
  - **Song Ziyou**, Heath Hofmann, Li Jianqiu, et al. A Comparison Study of Different Semi-active Hybrid Energy Storage
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System Topologies for Electric Vehicles[J]. Journal of Power Sources, 2015, 274: 400-411 (SCI, IF: 6.217)

- **Song Ziyou**, Heath Hofmann, Li Jianqiu, et al. Optimization for A Hybrid Energy Storage System in Electric Vehicles using Dynamic Programming Approach[J]. Applied Energy, 2015, 139: 151-162 (SCI, IF: 5.613)
- **Song Ziyou**, Li Jianqiu, Shuai Zhibin, et al. Fuzzy Logic Torque Control System in Four-wheel-drive Electric Vehicles for Active Damping Vibration Control[J]. International Journal of Vehicle Design, 2015, 68(1-3): 55-80 (SCI, IF: 0.405)
- **Song Ziyou**, Li Jianqiu, Wei Yintao, et al. Interaction of In-wheel Permanent Magnet Synchronous Motor with Tire Dynamics[J]. Chinese Journal of Mechanical Engineering, 2015, 28(3): 470-478 (SCI, IF: 0.598)
- Li Jianqiu, **Song Ziyou**, Shuai Zhibin, et al. Wheel Slip Control using Sliding Mode Technique and Maximum Transmissible Torque Estimation[J]. Journal of Dynamic Systems Measurement & Control, 2015, 137(11): 111010 (SCI, IF: 0.978)
- **Song Ziyou**, Heath Hofmann, Li Jianqiu, et al. The Optimization of A Hybrid Energy Storage System at Subzero Temperatures: Energy Management Strategy Design and Battery Heating Requirement Analysis [J]. Applied Energy, 2015, 159 (1): 576-588 (SCI, IF: 5.613)
- **Song Ziyou**, Hou jun, Heath Hofmann, et al. Sliding-mode and Lyapunov function-based control for battery/supercapacitor hybrid energy storage system used in electric vehicles. Energy, 2017, 122 (1): 601-612 (SCI, IF: 4.292)

## LANGUAGE SKILL

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- English: CET-6, Good at listening, speaking, reading and writing. Can use English as research language

## COMPUTER SKILLS

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- Matlab/Simulink: Data processing, modeling and control algorithm development
- Protel, Codewarrior: Tools for development of hardware and software of automotive electronics
- CANalyzer: Tools for development of CAN protocol

## AWARDS

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|---|---------|
| • Excellent Doctor Dissertation of Tsinghua University                            | 2016.07 |
| • Cercis Scholar Program Award of Tsinghua University                             | 2016.06 |
| • Excellent Graduate in Beijing   | 2016.06 |
| • Special Prize Scholarship (Highest honor in Tsinghua university)                | 2015.11 |
| • National Scholarship  | 2015.10 |
| • NSK Outstanding Paper Award of Mechanical Engineering                           | 2015.09 |
| • Scholarship of Tsinghua-Volvo (Ranked 2 <sup>th</sup> of 88)                    | 2013.11 |
| • Scholarship of Tsinghua-CASIC (Ranked 2 <sup>th</sup> of 88)                    | 2012.10 |
| • Excellent Bachelor Dissertation of DAE, Tsinghua University (10% in DAE)        | 2011.07 |
| • Excellent Graduate in Beijing (5% in Tsinghua)                                  | 2011.07 |
| • Excellent Graduate of Tsinghua University (10% in Tsinghua)                     | 2011.07 |
| • Champion of Tsinghua University Men's Basketball Tournament (4 times)           | 2010.12 |
| • Scholarship of Tsinghua-FastGear (Ranked 8 <sup>th</sup> of 89)                 | 2010.10 |
| • Scholarship of Tsinghua-KAOTEN (Ranked 9 <sup>th</sup> of 89)                   | 2009.10 |
| • The Third Prize of ZhouPeiYuan National College Students' Mechanics Competition | 2009.06 |
| • The Second Prize of Part of The National College students' Physics Competition  | 2008.12 |
| • Scholarship of Tsinghua-FastGear (Ranked 4 <sup>th</sup> of 89)                 | 2008.10 |

## SELF-ASSESSMENT

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- Solid foundation of Engineering Discipline. Master optimization and control theory, which can be used flexibly in research.
- Perseverance in scientific research and a strong curiosity in unknown knowledge. Not afraid of the difficulty and creative!