

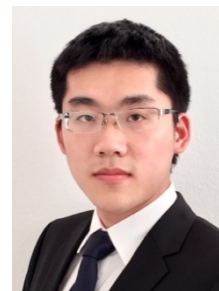
# Chenyang Zhou

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## Education

- 10.2015 – present** **M.Sc.** in Mechanical Engineering, **Karlsruhe Institute of Technology (KIT)**
- GPA: 1.2/1.0, focusing on the Mechatronics & Information Technology
  - Thesis: Decentralized Planning of Macro-Actions for Cooperative Automated Vehicles with Hierarchical Monte Carlo Tree Search
  - Supervisors: Prof. Dr.-Ing. J. Marius Zöllner, Prof. Dr.-Ing. Christoph Stiller
- 10.2014 – 09.2015** **Exchange Student** in Mechanical Engineering, **RWTH Aachen University**
- Thesis: Multi-Objective Optimization of Suspension Geometry for Achieving the Desired Wheel Kinematics Characteristics
  - Supervisor: Univ.-Prof. Dr.-Ing. Lutz Eckstein
- 09.2011 – 07.2015** **B.Eng.** in Vehicle Engineering, **Beijing Institute of Technology (BIT)**
- GPA: 91/100, Top 5%
  - National Merit Scholarship, Outstanding Undergraduates Award

## Research Experience

- 03.2018 – now** **FZI Research Center for Information Technology** **Karlsruhe, Germany**  
**Research Assistant**, Cooperatively Interacting Automobiles (DFG 1835)
- Integrated Deep Q-Network (TensorFlow) into Monte Carlo Tree Search (MCTS) to achieve faster convergence
  - Parallelization of MCTS with CUDA Thrust
- 06.2017 – 02.2018** **FZI Research Center for Information Technology** **Karlsruhe, Germany**  
**Master Candidate**, *Decentralized Planning of Macro-Actions for Cooperative Autonomous Vehicles*
- Proposed the algorithm **Decentralized Hierarchical Monte Carlo Tree Search (DecH-MCTS)** for decentralized hierarchical learning in multi-agent system
  - Applied this algorithm to achieve the decentralized cooperative planning of macro-actions (such as overtake, etc.) for automated vehicles
  - Validated its faster and better convergence in simulation environment (ROS&SUMO) with 6 conflict scenarios, analyzed and visualized the result with Python
- 12.2016 – 05.2017** **Daimler AG** **Stuttgart, Germany**  
**Intern**, *Development of Camera-based Driver Assistance System*
- Applied the idea of HoG-Vector (from Computer Vision) to the time-series analysis, extracted robust feature of two dimensions from CAN-data of 500 dimensions
  - Built a classifier with Random Forest to recognize the false alarms of Lane Departure Warnings with recall of 97%
- 01.2016 – 09.2016** **FZI Research Center for Information Technology** **Karlsruhe, Germany**  
**Research Assistant**, *Predictive Modeling in Electrical Mobility*
- Built a predictive model using nonparametric regression and Markov Chains to predict the following driving events with tolerance of  $\pm 5\%$

- 02.2015 – 09.2015**     **Institute for Combustion Engines, RWTH Aachen**     **Aachen, Germany**  
**Research Assistant**, *Development of a new Hybrid Powertrain with three Drive-Modes*
- Designed and simulated 8 drive cycles and finished the whole Model-in-the-Loop phase, found and solved 4 errors during the starting and mode change
- 01.2015 – 07.2015**     **Institute for Automotive Engineering, RWTH Aachen**     **Aachen, Germany**  
**Research Assistant**, *Optimization of axle kinematics using Genetic Algorithm*
- Applied the genetic algorithm NSGA-II and developed a toolchain to optimize any kind of suspensions to desired kinematic characteristics
- 05.2012 – 10.2013**     **National Undergraduate Training Program**     **Beijing, China**  
**Gait Control**, *Bionic Quadruped Robot with flexible Spine and elastic Feet*
- Implemented a CPG Network to realize 4 gaits (Trot, Walk, Pace, Gallop)
  - Introduced the Lateral-Stepping-Reflex based on an extended CPG-Network and ZMP theory, enabled the robot to keep balance under max. 1.5g lateral impact in the simulation environment (MSC-ADAMS&Simulink)

## Publications

- [1] \*Kurzer, K., \*Zhou, C., and Zöllner, J. M. (2018). **Decentralized Planning of Macro-Actions for Cooperative Automated Vehicles with Hierarchical Monte Carlo Tree Search**, in *IEEE Intelligent Vehicles Symposium (IV)*, 2018 (accepted).
- [2] Han, B., Jia Y., Li H., Luo Q., Zhou, C. (2016). **Posture Adjustment for Quadruped Robot Trotting on a Slope**, *Transactions of Beijing Institute of Technology* 36.3, 242-246.
- [3] Luo, Q., Zhou, C., Jia, Y., Gao, J., Liu, F. (2015). **CPG-Based Control Scheme for Quadruped Robot to Withstand the Lateral Impact**, *Transactions of Beijing Institute of Technology* 35.4, 384-390.
- [4] Luo, Q., Gao, J., Zhou, C., Huang, Y. (2015). **The structural design, simulation analysis and parameter optimization of the cheetah robot's leg components**, *Int. J. Computational Vision and Robotics* 5.1, 23-36.

## Patents

- [1] Luo, Q., Huang, Y., Gao, J., Zhou, C., Zhang, B., Liu, F. and Ke, Z. (2013). **Similar dual-A-arm suspended robot crotch lateral-deviation damping system**. CN103318290.
- [2] Luo, Q., Ke, Z., Zhou, C., Huang, Y., Liu, F., Zhang, B., and Gao, J. (2013). **Adjustable and controllable flexible bendable biological lumbar vertebrae structure system for quadruped robot**. CN103303389.
- [3] Luo, Q., Gao, J., Zhang, B., Liu, F., Zhou, C., Huang, Y., and Ke, Z. (2013). **Omni directional and self-adaptation elastic foot of quadruped robot**. CN103303388.

## Skills

- Languages**     native in Chinese, full professional proficiency in German (C1) and English (TOEFL 106)
- Programming**     C++, , R, MATLAB, ROS, C, Linux, Python, TensorFlow