Pengsong Zhang

PERSONAL DETAILS

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EDUCATION

2022.09-present **Ph.D.** **University of Toronto** **Toronto, Canada**

GPA: A+, | Mechanical & Industrial Engineering | Research Interest: Micro-/nano robotics, Computer vision, Reinforcement learning, Biomedical study

2018.09-2021.06 **M.Sc.** **JiangNan University** **Wuxi, China**

GPA: 88/100, **Ranking: 1/12** | Electrical engineering | Mechatronics technology | Thesis: Research on autonomous navigation of micro/nano robot based on magnetic drive optimization

2014.09-2018.06 **B.Eng.** **JiangNan University** **Wuxi, China**

GPA: 3.29/4, **Ranking: 2/70** (Comprehensive) | Electrical Engineering and Automation | Experiences: Electronic design, software design, embedded system, automatic control

PUBLICATIONS AND PROJECTS

[1] Peng Pan, **Pengsong Zhang**, et al., "Robotic rotation of C. elegans enables high-resolution imaging and precise physical phenotyping", Science Advances, 2023
SCI, **Co-first author**, Under review

[2] Peng Pan, **Pengsong Zhang**, et al., "Robotic microinjection enables large-scale transgenic studies of Caenorhabditis elegans", Science Robotics, 2023
SCI, Submitted

[3] **Pengsong Zhang**, Peng Pan, et al., "3D Motion and Reconfiguration of Magnetic Microswarms",
ACS Nano, 2023
SCI, Under review

[4] Guangming Cui, **Pengsong Zhang**, Qigao Fan et al., "Novel Coil Array Design and Modeling for Independent Control of Multiple Magnetic Microrobots," IEEE Transactions on Industrial Electronics, 2022.
SCI, Driven by electromagnetic coil matrix. DOI: 10.1109/TIE.2022.3222626.

[5] Qigao Fan, **Pengsong Zhang**, Juntian Qu et al., "Dynamic Magnetic Fields Generation With High Accuracy Modeling Applied to Magnetic Robots," IEEE Transactions on Magnetics, 2021.
SCI, **Corresponding Author**, Electromagnetic coil driver. DOI: 10.1109/TMAG.2021.3079252.

[6] Qigao Fan, Gaowen Zhu, **Pengsong Zhang** et al., "Vision Tracking Strategy of Micro-operation Execution End Based on Image Segmentation Model," Chinese Journal of Scientific Instrument, 2021.
EI, **Corresponding Author.** DOI：10.19650/j.cnki.cjsi.J2107549

[7] Qigao Fan, Yuanyuan Tang, Zhengqing Zhao, Gaowen Zhu, **Pengsong Zhang**, "Modeling and Control of Superparamagnetic Particle Microfluidic Transport Based on Magnetic Field Driving," Chinese Journal of Scientific Instrument, 2021.
EI, **Corresponding Author.** DOI：10.19650/j.cnki.cjsi.J2107886

[8] **Pengsong Zhang**, Qigao Fan, Zhenzhong Yu, "Autonomous Navigation of Magnetic Microrobot Based on Visual Feedback," Transducer and Microsystem Technologies, 2021.
CSCD, DOI: 10.13873/J.1000-9787(2021)06-0011-05.

[9] Postgraduate Research & Practice Innovation Program of Jiangsu Province, 2020, KYCX20_1935, "Research on Autonomous Navigation Technology of Microrobot Based on Magnetic Drive Optimization"
Principal Investigator, Project completed

COMPETITION EXPERIENCE

[1] 2020, Lane Line Recognition-China HUALU Cup Data Lake Algorithm Competition.
Second prize (2/580), National level, (Autonomous driving, Computer vision)

[2]	2019, Lip Language Recognition, XIAOMI & XINWANG Bank Chuangqingchun · Jiaozi Cup Competition. **First prize (1/1308)**, National level, (Time series data recognition, Computer vision)
[3]	2019, Baidu Star Artificial Intelligence Developer Competition. **First prize (1/1863)**, National level, (Lightweight model, Computer vision)
[4]	2019, Chinese Scene Character Recognition Technology Competition, China Artificial Intelligence Society. 9th (9/461), National level, (OCR, Computer vision)
[5]	2018, Moving object instance segmentation in Videos, Datafountain & Baidu. 9th (9/2444), National level, (Autonomous driving, Computer vision)
[6]	2018, Autonomous driving map optimization and sensor fusion, JingDong. 6th (6/390), National level, (Autonomous driving, Computer vision)
[7]	2018, Lane Line Detection Challenge In Autonomous Vehicle, Baidu. 4th (4/743), National level, (Autonomous driving, Computer vision)
[8]	2018, Huawei Cup-The 15th China Graduate Mathematical Contest in Modeling. **First prize**, National level, (Mathematical modeling, Algorithm)
[9]	2016, TI Cup-National College Student Electronic Design Invitational Competition. **First prize**, National level, (Embedded system, analog/digital signal processing)
[10]	2016, Electronic design competition for college students, Jiangsu Province. Second Prize, Provincial level, (Hardware, sensor design, automatic control)
[11]	2016, NXP cup smart car competition. Second Prize, Provincial level, (Hardware, sensor design, automatic control)
[12]	2015, Jiangsu Robot Competition, Biped/ Jump/UAV robot. Third Prize (three times), Provincial level, (Robot control)
[13]	2015, 2016, 2017, Jiangnan University Electronic Design Competition **First Prize** (three times), School level, (Hardware and power supply design)

TECHNICAL SKILLS

Algorithm:	Master user of deep learning frameworks such as Pytorch and PaddlePaddle; Well trained skills in vision, control, planning, and sensing
Programming:	Proficient in C, Python, C#; Familiar with using C++, JavaScript, PHP to develop projects, and have rich code debugging experiences
Hardware:	Technical expertise in STM32, DSP, FPGA and other embedded development experience, familiar with Altium Designer software, and have the ability to design electronic circuits independently
User-interface	Rich development experience in designing PC software and Web pages by using QT, PYQT, Winform, Wpf, ASP.NET, etc; Familiar with general industrial control communication methods

SUMMARY OF QUALIFICATIONS

Possessed good self-learning & driving abilities, strong practical ability, and a good foundation in software, hardware, and algorithms

Have interest, expectation, and dream in scientific research, have the spirit of persistence, and have been working hard to lay a solid foundation for realizing this goal

Once assisted the professor to establish a micro/nano operation/robotic laboratory, and was passionate about technological innovation

Served as the person in charge of enterprise project many times, formulated technical architecture, completed enterprise projects with the team, and have good teamwork ability

GitHub homepage: github.com/universea