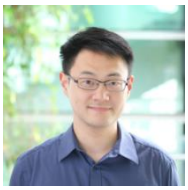
XIAO, Jiajian 肖佳健



IEEE member since 2016 | +(65) 8381 8875 | jiajian.xiao@outlook.com
Chinese, Singapore PR | Birthday: 30.08.1990 | https://jiajian-xiao.github.io/

WORK EXPERIENCE

2014.03 – present **TUMCREATE (Research Institute under National Research Foundation)** Singapore

Postdoctoral Research Fellow (Sep 2020 - present)

- (Until Jun 2022) Oversaw the simulation and modeling efforts on TUMCREATE side for the Singapore Integrated Transport Energy Model (SITEM) project, collaborating with IHPC A*STAR Singapore.
- Used a **simulation approach to create a digital twin** for conducting a comprehensive analysis of projected electric vehicle charging patterns and energy demand of Singapore in the future. Massive real-world input data pre-processing and simulation result data post-processing using various tools/scripts.
- All project members were awarded **2022 FireFly Silver Borderless Award** by Ministry of Trade and Industry, Singapore.
- (Start Jun 2022) Key software design and development member of the joint simulation laboratory (Mobility in Virtual Environments at Scale (MoVES) Lab).

Research Associate (Apr 2016 - Aug 2020)

- Daily tasks involved both engineering work and research work. Engineering work included continuous software development of CityMoS. Research focused on high-performance computing with a special focus on **hardware acceleration of agent-based simulations**.
- Created a general compiler framework to automate the acceleration of agent-based simulations on heterogenous hardware (a mixed hardware setting with CPUs, GPUs, FPGAs, and others).

Software Developer (Mar 2014 - Mar 2016)

- One of the major C++ backend and frontend developers of a microscopic agent-based traffic simulator – CityMoS *(citymos.net/)*.

2013.05 – 2014.03 **DOIDO** Munich, Germany

Co-Founder and main software developer

- Full stack development of the personal concierge service startup DOIDO including a NodeJS backend and a website and iOS frontend.
- The startup was incubated by Wayra Munich in 2013.

2013.07 – 2013.12 **Siemens** Munich, Germany

Student Intern / Software developer for the data assurance department

- Responsible for maintaining the business intelligence data of the entire company worldwide.

2012.10 – 2013.04 **TUMCREATE** Singapore

Research Assistant

- Invented a novel partition-based matching making algorithm for taxi-sharing which was **published at 2013 IEEE Conference on Intelligent Transportation Systems**. Tested on real-world data.

2011.02 – 2011.06 **Bühler Group** Shenzhen, China

Student Intern / Software developer

- Designed and developed a Management Scale System for controlling production line in real-time.

EDUCATION

2016.04 – 2022.10 **Technical University of Munich (TUM)**, Munich, Germany

- Ph.D. A Framework to Generate High-Performance Time Stepped Agent-based Simulations on Heterogeneous Hardware (Jointly Supervised by: Prof. Alois Knoll (TUM) and Prof. Wentong Cai (Nanyang Technological University))

2011.10 – 2013.12 **Technical University of Munich (TUM)**, Munich, Germany

- M. Sc. Computer Science *(Graduated with distinction)*

2007.09 – 2011.07 **Shanghai Jiao Tong University**, Shanghai, China

- B. Eng. Computer Science

2010.09 – 2011.02 **Hochschule für Technik Rapperswil**, Rapperswil, Swiss
- Exchange Student

TECHNICAL SKILLS & LANGUAGES

- Programming Languages/ Frameworks: C/C++/Objective-C, Java, JavaScript, NodeJS, Redis, ZeroMQ, Python, VB.NET, HTML+CSS, Assembly language (Intel/ARM), CUDA, OpenCL, OpenMP, MPI, OpenABL, Docker
- Databases: MySQL, Oracle DB, NoSQL e.g., MongoDB
- Operating systems: Windows / Linux / Mac OS
- Others: SAP ERP System, MS Office, Adobe Photoshop/Premiere
- Chinese (Native) / English (Full professional proficiency) / German (Working Level proficiency, CEFR B2)

SELECTED PUBLICATIONS

Full list on Google Scholar: https://scholar.google.com.sg/citations?user=UJknDkwAAAAJ&hl=en or scan

- *A survey on agent-based simulation using hardware accelerators*. Xiao, J., Andelfinger, P., Eckhoff, D., Cai, W. and Knoll, A., 2019. ACM Computing Surveys (CSUR), 51(6) **(IF: 14.324, top computer science journal)**
- *Exploring execution schemes for agent-based traffic simulation on heterogeneous hardware*. Xiao, J., Andelfinger, P., Eckhoff, D., Cai, W., & Knoll, A.; In 2018 IEEE/ACM International Symposium on Distributed Simulation and Real Time Applications **(Best Paper Award)**
- *A Partition-Based Match Making Algorithm for Dynamic Ridesharing*. Pelzer, D., Xiao, J., Zehe, D., Lees, M.H., Knoll, A.C., Aydt, H.; 2015. IEEE Transactions on Intelligent Transportation Systems **(IF 9.551, top transportation journal)**
- *Pedal to the Bare Metal: Road Traffic Simulation on FPGAs Using High-Level Synthesis*. Xiao, J., Kilinç, G., Andelfinger, P., Eckhoff, D., Cai, W., & Knoll, A. In Proceedings of the 2020 ACM SIGSIM Conference on Principles of Advanced Discrete Simulation **(1st known effort for agent-based traffic simulations using HLS)**
- *OpenABLext: An automatic code generation framework for agent-based simulations on CPU-GPU-FPGA heterogeneous platforms*. Xiao, J., Andelfinger, P., Cai, W., Richmond, P., Knoll, A., & Eckhoff, D. 2020. Concurrency and Computation: Practice and Experience, e5807
- *OptCL: A Middleware to Optimise Performance for High Performance Domain-Specific Languages on Heterogeneous Platforms*. Xiao, J., Andelfinger, P., Cai, W., Eckhoff, D., & Knoll, A. In 2021 International Conference on Algorithms and Architectures for Parallel Processing **(A middleware accelerates not only agent-based simulation but also general arithmetic e.g., machine learning algorithms)**