XIANZHONG DING

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EDUCATION

University of California, Merced *August 2018 - present*
Ph.D. student in Electrical Engineering and Computer Science
Shandong University, China *August 2015 - June 2018*
M.S. student in Computer Science and Technology
Taishan University, China *August 2010 - June 2014*
B.S. student in Computer Science and Technology

RESEARCH INTERESTS

Applied Machine Learning/Deep Learning, Deep Reinforcement Learning (DRL), Edge Computing, Wireless Networking and Internet of Things.

SKILLS

Programming languages: Python, C/C++, Java, Matlab
Deep learning framework: Tensorflow, Pytorch
Tools and Libraries: Keras, Scikit-learn, OpenAI gym, Pandas, Jupyter, OpenCV

RESEARCH EXPERIENCE

Research Assistant, EECS, UC Merced *August 2018 - present*
1. Model-Based Deep Reinforcement Learning for Multi-zone Building Control:
- Propose an efficient model-based DRL building control system.
- Develop a weighted ensemble learning to solve building neural network model uncertainty.
- Adopt a model predictive path integral control method to perform building control.

Publication-1: "MB^{2}C : <u>M</u>odel-<u>B</u>ased deep reinforcement learning for <u>M</u>ulti-zone <u>B</u>uilding <u>C</u>ontrol", **Xianzhong Ding**, Wan Du, and Alberto Cerpa, *ACM International Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation (BuildSys'20)*, Japan, November 2020. **Best Paper Runner-Up Award**, **Best Presentation Award**

2. Real-Time Object Detection on Mobile Devices:
- Build a deep neural network-based object detection method on mobile devices without offloading.
- Propose a parallel detection and tracking pipeline to fully utilize the computation resource on current mobile devices for high detection accuracy.
- Design an algorithm to adapt the DNN models according to the change rate of video content.

Publication-2: "Continuous, Real-Time Object Detection on Mobile Devices without Offloading", Miaomiao Liu, **Xianzhong Ding**, Wan Du, *IEEE International Conference on Distributed Computing Systems (ICDCS'20)*, Singapore, December 2020.

3. DRL for Holistic Smart Building Control:
- Leverage DRL to balance the trade-off between energy use and human comfort for smart buildings.
- Adopt a special reward function and a novel neural network architecture to tackle the challenges imposed by the combined joint control of four subsystems with a very large action space.
- Tackle data training requirement by adopting a simulation strategy for data generation, and spending effort in calibrating the simulations to make them as close as possible to the target building.

Publication-3: "OCTOPUS: Deep Reinforcement Learning for Holistic Smart Building Control", **Xianzhong Ding**, Wan Du, and Alberto Cerpa, *ACM International Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation (BuildSys'19)*, New York, November 2019.

Research Assistant, EECS, Shandong University   *August 2016 - May 2017*

4. Improve Packet Matching Performance for Software-Defined Networking Switch:
• Propose a hybrid TCAM architecture to make full use of high density of nvTCAM and efficient access of sTCAM.
• Design a novel rule migration strategy to improve the rule update performance.
• Contribute a replacement value algorithm to choose the best rules to be evicted in both nvTCAM and sTCAM to further improve packet matching performance.

Publication-4: "Unified nvTCAM and sTCAM Architecture for Improving Packet Matching Performance", **Xianzhong Ding**, Zhiyong Zhang, Zhiping Jia, Lei Ju, Mengying Zhao, Huawei Huang, *ACM SIGPLAN / SIGBED Conference on Languages, Compilers, and Tools for Embedded Systems (LCTES'17)*, Barcelona, June 2017.

Publication-5 "Unified nvTCAM and sTCAM Architecture for Improving Packet Matching Performance", **Xianzhong Ding**, Zhiyong Zhang, Zhiping Jia, Lei Ju, Mengying Zhao, Huawei Huang, *Design Automation Conference (DAC'17)*, Work in Progress, Austin, June 2017.

HONORS AND REWARDS

Bobcat Summer Fellowship, EECS, UC Merced	*2021*
Best Paper Runner-Up Award at BuildSys 2020	*2020*
Best Presentation Award at BuildSys 2020	*2020*
Bobcat Summer Fellowship, EECS, UC Merced	*2020*
ACM SenSys 2019 NSF student travel grant	*2019*
Bobcat Summer Fellowship, EECS, UC Merced	*2019*
First level scholarship of Shandong University,	*2017 - 2018*
Third level scholarship for comprehensive performance, Shandong University	*2016 - 2017*
Scholarship for outstanding academic performance, Shandong University	*2015 - 2016*