Adith Boloor

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Experience

2016 – · · · · **Washington University in St. Louis** Graduate Researcher
Developed an image compression method to perform convolution in a camera sensor in the analog domain
Published paper that modifies the camera lens to amplify the strength of adversarial attacks
Published paper in which we successfully attacked self-driving vehicle's deep neural networks to cause lane infractions and collisions.
Head TA of Computer Vision course with Prof. Ayan Chakrabarti in Fall 2020
Lead over 20 undergraduate researchers to use PiCar platform for studying and optimizing power management with reinforcement learning

2018 – 2018 **Opcoder AI** Software Developer
Startup to utilize Natural Language Processing (NLP) algorithms to improve hospital billing processing speed by assisting human coders

2014 - 2014 **Purdue M2M Lab** Undergraduate Researcher
Developed HARMS (Humans, Agents, Robots, Machines, Sensors) protocol for integrating UGVs and humanoid robots to aid in fire rescue scenarios
Programmed and calibrated Darwin-OP humanoid robots' locomotion gaits to allow navigation to the fire source and to enable fire suppression.

Education

2018 – · · · · **Ph.D. Computer Science** Washington University in St. Louis, USA

2016 – 2017 **M.Eng. Robotics** Washington University in St. Louis, USA

2015 – 2015 **B.S. Mechanical Engineering** Shanghai Jiao Tong University, China
Engineering Term Abroad

2012 – 2016 **B.S. Mechanical Engineering** Purdue University, West Lafayette, USA

Skills

Concepts — Machine Learning, Artificial Intelligence, Robotics, Adversarial ML, Computer Vision, AI on Edge

Coding — Python, Linux, C

AI specific — PyTorch, Tensorflow, Huggingface, AWS

3D engines — Blender, Unreal Engine, Godot, Unity

Miscellaneous Experience

Awards and Achievements

2023 **CSRMP** Accepted into the Google Computer Science Research Mentorship Program

2019 **Jane Self-driving Algorithm** Third, Carla Autonomous Driving Challenge, CVPR

2001 **OpCoder AI** Second, Discovery Competition, Washington University

2017 **PiCar Project** Top 10, Silk Road Robotics Innovation Competition, Xi'an, China

2015 **Project GreenLight** Top 5, BoilerMake Hackathon, Purdue University

2014 **Speech Controlled Quadropod** First, Micro-controllers Contest, Instructables

Research Publications

1. T. Ma, **A. Boloor**, X. Yang, *et al.*, "Leca: In-sensor learned compressive acquisition for efficient machine vision on the edge," in *Proceedings of the 50th Annual International Symposium on Computer Architecture (ISCA '23)*, 2023. DOI: 10.1145/3579371.3589089.

2. **A. Boloor**, T. Wu, P. Naughton, A. Chakrabarti, X. Zhang, and Y. Vorobeychik, "Can optical trojans assist adversarial perturbations?" In *Proceedings of the IEEE/CVF International Conference on Computer Vision Workshops: Adversarial Robustness in the Real World*, 2021, pp. 122–131.

3. W. Cao, Y. Zhao, **A. Boloor**, Y. Han, X. Zhang, and L. Jiang, "Neural-pim: Efficient processing-in-memory with neural approximation of peripherals," *IEEE Transactions on Computers*, vol. 71, no. 9, pp. 2142–2155, 2021.

4. **A. Boloor**, K. Garimella, X. He, C. Gill, Y. Vorobeychik, and X. Zhang, "Attacking vision-based perception in end-to-end autonomous driving models," *Journal of Systems Architecture*, vol. 110, p. 101 766, 2020.

5. J. Yang, **A. Boloor**, A. Chakrabarti, X. Zhang, and Y. Vorobeychik, "Finding physical adversarial examples for autonomous driving with fast and differentiable image compositing," *arXiv preprint arXiv:2010.08844*, 2020.

6. **A. Boloor**, X. He, C. Gill, Y. Vorobeychik, and X. Zhang, "Simple physical adversarial examples against end-to-end autonomous driving models," in *2019 IEEE International Conference on Embedded Software and Systems (ICESS)*, IEEE, 2019, pp. 1–7.

7. **A. Boloor**, *Arduino by example*. Packt Publishing Ltd, 2015.

8. A. Wagoner, **A. Boloor**, E. T. Matson, *et al.*, "Humanoid robots rescuing humans and extinguishing fires for cooperative fire security system using harms," in *2015 6th International Conference on Automation, Robotics and Applications (ICARA)*, IEEE, 2015, pp. 411–415.