Kenneth (Kira) H. Chan

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Education:

Ph.D. - Computer Science and Eng., Michigan State University, East Lansing **Exp. May 2025 - GPA: 4.0/4.0**
Research Focus: Addressing the assurance of machine learning components for software engineering.
M.S. - Computer Science and Eng., Michigan State University, East Lansing **May 2021 - GPA: 4.0/4.0**
B.S. - Computer Science and Eng., Michigan State University (Honors), East Lansing **May 2019 - GPA: 3.76/4.0**

Selected Publications and Project Experience:

SafeDriveRL - *K. Chan*, S. Zilberman, N. Polanco, and B.H.C. Cheng (SEAMS 2024) Lisbon, Portugal
- Synthesized reinforcement learning and non-cooperative game theory to discover human-induced misbehaviors for autonomous vehicles trained with machine learning, discovering up to 25% failures.

Expound - *K. Chan* and B.H.C. Cheng (Sym. on Search-based Software Eng. 2023) San Francisco, U.S.
- Proposed a novelty search approach to discover *diverse* adversarial examples, leading to more than 300% increased *types* of unique failures in image classifier DNNs using the exploration/exploitation paradigm.

EvoAttack - *K. Chan* and B.H.C. Cheng (Sym. on Search-based Software Eng. 2022) Singapore
- Demonstrated that black-box evolutionary search-based adversarial examples apply to state-of-the-art object detection algorithms, preventing the correct detection of *all* objects for existing models.

Work Experience:

Graduate Researcher, 2021 - Current Michigan State University - East Lansing, MI
- Developed techniques to address / improve the assurance and robustness of DNNs to ensure their correctness in the face of adverse perturbations or uncertainties (human-induced, environmental, etc.).
- Applied technologies from a number of distinct disciplines (e.g., reinforcement learning, evolutionary computing, game theory, etc.) to assess and improve the robustness of DNNs and software.

Software Engineer (Capstone project), 2018 Volkswagen - Auburn Hills, MI
- Designed and developed a demo application which introduces potential customers to VW's connected interactive phone car services and familiarized existing customers with new system features.
- Developed applications for the Android platform (Kotlin), using Firebase, Eventbus, and OAuth.
- Worked in a team of 4 teammates, corresponding with our customer via weekly meetings.

Software Engineer (Intern), Summer 2015 GeoNexus Technologies - Ann Arbor, MI
- Designed and developed a prototype application to extend GeoNexus' geographic information system to visualize work order services on a map for handheld devices for customers with 2 other interns.
- Technologies used include Android Studio (Java), pair programming, unit testing, threads, Git, and SQL.

Teaching Experience:

Graduate Assistant, 2019 - Current (16 semesters) Michigan State University - East Lansing, MI
Courses: CSE435 Software Engineering (8 semesters), CSE812 Distributed Systems, CSE477 Web Dev., CSE476 Mobile App Dev., CSE 335Object-Oriented Software Development, CSE260 Discrete Mathematics.
- Created 35+ assignments, projects, and exams designed to transform concepts into practical application.
- Presented 6 guest lectures on machine learning, DNNs, software engineering, and computer security.
- Organized, led, and trained 35+ teaching assistants and undergraduate assistants.
- Assisted, managed, and taught classes with up to 200 students per semester (2,000+ students total).

Honors and Awards:

Dr. Delia Koo Global Student Scholarship and Chinese Student Endowment - 2023 $5,000
Auto-Owners Exposition Award - 2018
Blue Oval STEM Scholarship (Ford Motor Company) - 2015-2019 $2,500 - Renewable for 4 Years

Skills:

Languages: Python, Java, C/C++, HTML/CSS, JavaScript, Shell/Bash, PHP, SQL **Systems:** Linux/Unix, Windows
Tools: PyTorch, pandas, TensorFlow, Latex, SVMs, DNNs (RetinaNet, YoloV5, Faster-RCNN, ResNet20, etc.)