ERIC JI

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EDUCATION

University of Illinois Urbana-Champaign August 2020 - Present
Bachelor of Science in Computer Engineering GPA: 3.92/4.0

Relevant Courses: Calculus III, Linear Algebra, Intro to Differential Equations, Applied Machine Learning, Discrete Structures, Data Structures, Intro to Algorithms and Models of Computation, Analog Signal Processing, Digital Signal Processing, Digital Systems Laboratory, Individual Research Study

PUBLICATIONS

E. Ji, B. Dong, B. Samanthula, N. Zhou, *"2D-FACT: Dual-Domain Fake Image Detection Against Text-to-Image Generative Models"* - MIT Undergraduate Research Technology Conference (URTC 2023).

S. K. Kamtikar, **E. Ji**, N. K. Uppalapati, G. Krishnan, G. Chowdhary. *"Realistic Simulation Environments to Achieve Visual Servoing on Soft Continuum Arms in Constrained Environments"* - Fourth International Workshop on Machine Learning for Cyber-Agricultural Systems (MLCAS 2022).

EXPERIENCE

Vision Group - Dr. Svetlana Lazebnik August 2023 - Present
Research Assistant at University of Illinois Urbana-Champaign

- Working to develop a classifier capable of detecting synthetic images generated by state-of-the-art GANs and Diffusion Models
- Utilizing the phase response from images by building a complex Convolution Neural Networks with complexPyTorch that can handle complex arithmetic
- Training with established datasets to benchmark performance against methods from reputable papers

NSF Research Experiences for Undergraduates June 2023 - August 2023
Research Assistant at Montclair State University Site

- Designed a data collection algorithm to compile a comprehensive dataset containing 12,500 images from MSCOCO and 12,500 corresponding images generated using Stable Diffusion 2.1
- Developed multiple ResNet models and other Convolutional Neural Networks to distinguish AI-generated images from real images
- Analyzed the accuracy, robustness, and efficiency of classifiers in both the spatial and frequency domains by evaluating the effects of dataset size, model complexity, and image perturbations

Distributed Autonomous Systems Laboratory May 2022 - August 2023
Research Assistant at University of Illinois Urbana-Champaign

- Trained an object detection algorithm (YOLO) to detect Japanese Beetles for autonomous mobile robots that survey crop fields
- Generated realistic simulation environments using Blender to assist with visual servoing on soft arms
- Designed a path planning algorithm to generate a series of waypoints on a point cloud from a starting point to a target while avoiding obstacles

PROJECTS

MNIST Classification through Edge Boxes
Developed a Python notebook with an Android app that employs a series of image processing and machine learning techniques such as Canny edge detection, bilinear interpolation, PCA, and mutli-layer perception to efficiently detect, bound, and classify handwritten digits anywhere within an image

Query Based Named Entity Recognition
Created a Python program that performs a query-based web search and scrapes the text to feed it through a named entity recognition algorithm and rank the top entities detected

Flights
Implemented various C++ graph algorithms on open flights data set, that contains 67,000+ routes between airports across the globe, to create visualizations of the paths according to user input

Computer Science Course Catalog
Designed an Android app in Java that utilizes data of 50+ computer science courses offered at the University of Illinois and displays them in a filterable catalog that supports student ratings

TEACHING

ECE 120: Introduction to Computing Fall 2023 Semester
Course Grader

- Responsible for correcting written assignments and providing meaningful feedback on students' work

CS 125: Introduction to Computer Science Spring 2021 Semester
Course Assistant

- Devised interactive course materials for students by recording step-by-step tutorials and solutions
- Worked one-on-one with students who faced difficulties with course material and projects

LEADERSHIP

Eta Kappa Nu Alpha Chapter (Outreach Committee Member) August 2022 - Present
Host both one-on-one and group tutoring sessions, mentor students on their academic/career goals, and plan activities that introduce engineering concepts to local students

Illini Bass Fishing Club (Secretary) August 2022 - Present
Recruit new members to join a community of 100+ anglers, collaborate with other universities and sponsors to host collegiate tournaments, and organize recreational events

TECHNICAL SKILLS

Languages C, C++, Java, Python, SystemVerilog, LaTex