Jieun Seong

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jieun.seong@math.gatech.edu | (404) 667-6952 | jieun-seong
jieun-seong | jseong8

Education

MS in Comp. Sci. and Engineering @ Georgia Tech, *GPA: 3.60/4.00* 2020 – Present
MS in Mathematics @ Georgia Tech, *GPA: 3.80/4.00* 2017 – 2019
BS in Discrete Mathematics @ Georgia Tech, *GPA: 3.92/4.00* 2013 – 2017

Research

Differentiability at the Tip of Arnold Tongues 2019 – 2021

Proved analytically the differentiability at the tip of the Arnold Tongue – the set of parameters in the standard map equation that gives a given rotation number. Used C and Julia to carry out numerical experiments to research the differentiability. This has many applications like celestial mechanics. Some of the results and codes are available to see on my GitHub.

Skills

Programming

C/C++, Python, MATLAB, Julia, Java, TeX, PyTorch, SciPy, OpenCV, Git, Colab, Linux

Knowledge

Computer Vision, Dynamical Systems, Differential Equations, Numerical Analysis, Linear Algebra, Parallel Computing, Algorithms, Data Structures, Machine Learning, Data Analysis, Optimization, Modeling and Simulation, Deep Learning

Projects

Semantic Segmentation of Images with Deep Learning

Implemented Pyramid MaxPooling to semantically segment different objects in images from Camvid and Kitti datasets with PyTorch.

MNIST Handwriting Recognition

Implemented a simple softmax regression and two-layer multi-layer perceptron (MLP) for MNIST Handwriting Recognition from scratch.

Differential Growth: Modeling and Simulation

Modeled and simulated the exquisite growth patterns found in nature – plant leaves, coral reefs, cabbage, brain, and fingerprints.

ConvNet for CIFAR-10

Built a two-layer network from scratch and built a two-layer network and a vanilla convolutional neural network using PyTorch.

SIFT Local Feature Matching

Implemented Harris Corner Detectors, Local Feature Descriptors, and Feature Matching methods to match points in two images of an object.

Camera Calibration and Fundamental Matrix Estimation

Estimated the camera projection matrix and fundamental matrix given matching points in two images.

Style Transfer

Applied a SqueezeNet to produce a new image that reflects the content of one but the ”artistic” style of the other. Used PyTorch.

Network Visualization
Implemented Saliency Maps and Gradient Class Activation Mapping (GradCAM) for model interpretability on images. Used PyTorch.

Source Separation
Modified the modules inside Open-Unmix music source separation model to better its performance in separating different sources in music.

Experiences

Graduate Teaching Assistant 2017 – Present
Georgia Institute of Technology Atlanta, GA
Teach 30-60 students every semester on college math subjects like linear algebra, multivariable calculus, and differential equations. Evaluate their performances regularly by collaborating with other instructors and teaching assistants on grading quizzes, projects, and exams. Hold weekly office hours to help students who want extra help.

Digital Systems Design Lab Assistant 2014 – 2015
Georgia Institute of Technology Atlanta, GA

Prototype Designer / App Developer Atlanta, GA
OshKosh B'gosh 2014 – 2015
Designed and produced a prototype for a speaker. Built speaker with SolidWorks, 3D printer, soldering, and circuit design. Developed an app to be used for the speaker with AppInventor.

Awards

Georgia Tech President's Undergraduate Research Award $1,500 2016

Outreach

Leader of Women in Georgia Tech Korean Student Association 2018 – 2019
Secretary of Georgia Tech Korean Student Association 2017 – 2019
Volunteer at Korea Methodist Church of Norcross Food Pantry 2014 – 2015
Women in Electrical and Computer Engineering 2014 – 2015
Study Abroad in China - "Language for Business and Technology: China" 2015