Shayan Sadigh

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Education

Major:	Computer Science, **B.S. + M.S.**	**GPA:**	B.S. 3.60 / M.S. 3.85
School:	University of California, Santa Barbara	**Years:**	2013 - 2017 / 2017 - 2018

Overview

Objective
I want to help push the boundaries in artificial intelligence and apply machine learning in innovative ways to big, important, open-ended problems.

Languages
Top: Python, C, C++
Others: Javascript, Java, C#, x86, Ruby, SQL, MATLAB

Top Areas of Knowledge
Deep learning (and related fields), Software engineering, Computer networks, Web and network security, Web development

Tools
Pytorch, Tensorflow, Wireshark, libpcap, OWASP ZAP, Git, AWS, Google Cloud, Node.js, Ruby on Rails

Selected Independent Activities

Kaggle Winner: Won **10th place** in **$1.5 million Passenger Screening Challenge** as solo competitor. #1 featured machine learning contest on kaggle.com for 6 months. Created custom neural network where viewpoints are fed to ResNet CNN with spatial pyramid pooling and fused by LSTM with attention. Name on leaderboards is Moejoe.

GauchoMap (300+ users): Published popular Chrome extension for UCSB students. Uses javascript, web scraping.
Piazza.com Vulnerabilities: Discovered and reported multiple severe web vulnerabilities on Piazza.com.
Mobile Wifi Hijacker: Modified rooted Android phone into WiFi “hijacker” that man-in-the-middles nearby devices.

Work Experience

Palo Alto Networks (paloaltonetworks.com) **Dataplane Software Engineer Intern** (2017)
- Increased productivity by developing internal Python script for parsing PCAPNG packet capture format.
- Improved debuggability by redesigning team’s lab. Set up subnets, network routes, and racked devices.
- Worked in C to implement PCAPNG packet captures on flagship PAN firewalls.

Thermo Fisher Scientific (fei.com) **Software Engineer Intern** (2016)
- Improved usability of product by coding new installer in C# for Hyperion Scanning Probe Microscope.
- Documented system bringup, backup and restore procedures for new Hyperion system.

UCSB Brain Initiative (brainucsb.com) **Lead Web Developer** (2015)
- Planned and developed website for new UCSB department with campus researchers and web designer.
- Wrote all backend logic (Node.js) and much of frontend design (HTML / CSS / Javascript).

Recent Course Projects

Real-time Path Tracing by Denoising with Convolutional Neural Networks: Proposed and implemented real-time path tracer by repurposing Feature Pyramid Networks of Lin et al. (2017) for denoising.

Homomorphic Encryption on Neural Networks: Implemented homomorphically encrypted neural networks with Vector Homomorphic Encryption of Zhou and Wornell.

Exploring Seq2Seq For Generating Human-Like Responses on Internet Forums: Trained a deep learning agent to predict responses to Reddit posts with Seq2Seq neural network of Sutskever et al.

Twitter Sentiment Analysis with Neural Networks: Educational paper detailing how to apply deep learning to the sentiment analysis task by creating a neural network in Numpy and again in Keras.

Research Activity

I formally began research at UCSB in January 2018.

Start date: January 2018 Location: MIRAGE Lab
Collaborating with professor Pradeep Sen of UC Santa Barbara and professor Victor Fragoso of West Virginia University to solve the image correspondence problem with neural networks. In particular, I have proposed a **Hierarchical Correspondence Network**, a generalization of the Universal Correspondence Network of Choy et al. (https://arxiv.org/pdf/1606.03558.pdf).

Start date: Spring? 2018 Location: UCSB NLP Lab
Proposed **gaze networks**, an alternative to convolutional networks, and **hebbian pruning**, a method to prune network weights during training for regularization and improved CPU performance, to UCSB NLP lab. Both ideas are on hold until I conclude hierarchical correspondence network.

Please see my Github for a basic implementation of hebbian pruning and other projects.

Relevant Coursework

Deep learning for NLP	Parallel programming	Data structures and algorithms
Computer vision	Operating systems	Computational geometry
Artificial intelligence	Compilers	Theory of computation
Knowledge bases	Computer architecture	Computational science
Distributed systems	Programming languages	Differential equations
Databases	Scalable web applications	Vector calculus
Computer security	Mobile networks	Probability and statistics
Cryptography	Computer networks	

Awards and Achievements

- Gold medal recipient and 10th place standing in $1.5 million Kaggle Passenger Screening Algorithm Challenge sponsored by Department of Homeland Security.
- 2017 recipient of Glen Culler Scholarship, a merit-based scholarship for academic achievement.
- Ee-dan (2nd-degree black belt) in Korean martial art of Soo Bahk Do, taught under Master Dan Lockhart.
- Classically trained pianist with four stage performances from ages 10 through 16.
- Two Youtube channels with combined 4,000+ subscribers and 1.2 million video views.
- 7x member of Dean's List at UCSB.
- GRE: 166 Q, 162 V, 5.5 W ACT: 34

Recent Talks and Lectures

- **Original Work:** *An end-to-end trainable neural network for threat recognition on 3D body scans*
  - Presented to Four Eyes Lab 02 / 2018
- **Original Work** : *Realtime Pathtracing with Neural Networks*
  - Presented to Special Topics seminar 12 / 2017
- **Paper Discussion:** *Imagination-Augmented Agents for Deep Reinforcement Learning*
  - Presented to NLP seminar 01 / 2018
- **Paper Discussion:** *Representation Learning on Graphs: Methods and Applications*
  - Presented to Dynamic Networks seminar 01 / 2018
- **Paper Discussion:** *A Simple Neural Network Module for Relational Reasoning*
  - Presented to NLP seminar 11 / 2017

Other

- Natively bilingual in English and Farsi, interested in learning Mandarin Chinese.
- U.S. citizen.