# Shayan Sadigh

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## Education

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|---|---|---|---|
| **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 push the boundaries in artificial intelligence and apply machine learning in innovative ways to big, important, open-ended problems.

**Top Areas of Knowledge**
Deep learning (and related), Computer networking, Web and network security, Web development

**Languages**
Python, C, C++ (Top languages)
Javascript, Java, C#, MATLAB, x86, Ruby, SQL

**Top Tools**
Pytorch, Tensorflow, Wireshark, libpcap, Git, AWS, Ruby on Rails, Node.js, Visual Studio, Perforce, OWASP ZAP

## Independent Activities

**Kaggle Winner**: Won **10th place** in **$1.5 million Passenger Screening Challenge** as a solo competitor. #1 featured 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 the leaderboards is Moejoe.

**GauchoMap** (300+ users): Published popular Chrome extension for UCSB students. Uses javascript, web scraping.
**Piazza.com Web Vulnerabilities:** Discovered and reported multiple severe vulnerabilities on Piazza.com.
**Mobile Wifi Hijacker:** Turned rooted Android phone into a WiFi “hijacker” that intercepts traffic from nearby devices.

## Work Experience

**Palo Alto Networks** (paloaltonetworks.com) **Dataplane Software Engineer Intern** (Summer 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** (Winter 2017)
- Improved usability of product by coding new installer for Hyperion Scanning Probe Microscope.
- Documented system bringup, backup and restore procedures for new Hyperion system.

**UCSB Brain Initiative** (brainucsb.com) **Lead Web Developer** (2015-2016)
- 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).

## Graduate 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 (2014).

***Exploring Seq2Seq For Generating Human-Like Responses on Internet Forums***: Made a Reddit bot by training a deep learning agent to predict responses to Reddit posts with Seq2Seq of Sutskever et al. (2014).

***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.

## Selected Courses

Deep learning for natural language processing
Computer vision
Knowledge bases
Artificial intelligence
Computational geometry
Distributed systems
Databases
Computer networking
Mobile networks
Computer security
Operating systems
Scalable Web Applications
Parallel programming
Computational science
Programming Languages
Compilers
Data structures and algorithms
Theory of computation
Differential equations
Vector calculus

## 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.
- 7x member of Dean's List at UCSB.
- Classically trained pianist with four stage performances from ages 10 through 16.
- GRE: 166 Q, 162 V, 5.5 W  ACT: 34

## Selected 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.