Hongwei (Henry) Zhou

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EDUCATION

University of California, Santa Cruz	Sept 2019 – Present
PhD in Computational Media	
New York University, Tandon School of Engineering	Sept 2015 – May 2019
BS in Computer Science, Minor in Game Engineering	GPA: 3.988

AWARDS

Richard W.Block Award (Valedictorian), *New York University, NY*	May 2019
Myron M. Rosenthal Award for best academic achievement, *New York University, NY*	May 2018

ACADEMIC RESEARCH

Machine Learning for Natural Language Research, *University of California, Santa Cruz, CA*   Sep 2019 – Present

Skills: Python, GPT-2, BERT

- Working with Word Embeddings generated by current state-of-the-art language models such as BERT and GPT-2.
- Exploring questions such as data visualization and data-sensemaking of high-dimensional word embedding data, this includes working with dimensionality reduction methods such as t-SNE and UMAP.
- Exploring algorithms to analyze the potential geometric structure that arises from word embeddings, this involves algorithms such as Nearest Neighbors to discover clusters. Currently researching the potential of Physarum polycephalum (Slime mold) model for structure visualization and discovery.

Artificial Intelligence for Games Research, *New York University, NY*   Jan 2018 – Jun 2018

Skills: Pommerman framework, Python

- Developed an AI agent by combining finite state machine architecture and Monte-Carlo tree search.
- Analyzed the game code and optimized the Monte-Carlo tree search algorithm to achieve a balance between computational speed and in-game performance with 82% win rate.
- **Publication:** Zhou, Hongwei, et al. "A hybrid search agent in pommerman." Proceedings of the 13th International Conference on the Foundations of Digital Games. ACM, 2018..

Atom of Confusion Research Intern, *New York University, NY*   Dec 2016 – Sep 2017

Skills: Eclipse compiler, Clojure

- Developed 5 different programs that go through Abstract Syntax Tree of Eclipse compiler to find confusing elements in the C and C++ source code.
- Developed a Clojure program that explores code bases on GitHub to gather data on the usage of the Operator Precedence confusing atoms. Worked closely with the researchers to gather data and hypothesize about programming styles.
- **Publication**: Gopstein, Dan, et al. "Prevalence of confusing code in software projects: atoms of confusion in the wild." Proceedings of the 15th International Conference on Mining Software Repositories. ACM, 2018.

EXPERIENCE

Various Machine Learning Projects, *University of California, Santa Cruz, CA*   May 2019 – Present

Skills: Tensorflow, Keras

- Experimented with different recurrent neural network models (RNN, GRU, LSTM) as well as different pretrained word embeddings for predicting the positive or negative sentiment from imdb review data.
- Developed an art project that utilizes genetic algorithm and ImageNet classifiers. The program generates random artwork and optimizes its parameters to trick the classifiers into identifying certain labels with high confidence.

Intelligence System Engineer, *Electronic Arts, CA*   May 2018 – Aug 2018

Skills: Google Magenta, FluidSynthPy, PrettyMIDI, HTML, Ruby on Rails, Python

- Developed a versatile music streaming software that can synthesize MIDI music format and Magenta note format in real-time.
- Implemented features such as adding/deleting musical notes, shifting musical modes, changing volumes by instruments and changing music tempo. The effect can be applied and heard in real-time as the music plays.
- Worked closely with mentor to break down software into different desynchronized components to support artificial intelligence plug in and to support running different components on different machines.

Teaching Assistant

University of California, Santa Cruz, CA	Oct 2019 – Present
New York University, NY	Oct 2017 – Aug 2019

- Teaching Assistant for Design and Analysis of Algorithms, Intro to Game Programming, Intro to Database, Data Structure and Algorithms and Game Design Practicum. Design assignments, communicate with students and grade assignments.