Anthony J. Clemens

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Portfolio: https://ajclemens.github.io
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Highly-motivated chemical engineer, adept in data science, Python programming, machine learning and statistics.

EDUCATION

9/2016 – 6/2020	University of California, Santa Barbara **Bachelor of Science, Chemical Engineering** Cumulative GPA: **3.55**; Upper-division major GPA: **3.65**
9/2020 - 12/2020	**General Assembly Data Science Immersive** 12-week comprehensive data science boot camp. Over 480 hours of instruction in Python. Data visualization, classical statistical models, machine learning, neural networks, cloud computing.

RESEARCH EXPERIENCE

6/2019 – 9/2019   **Undergraduate Research,** Segalman and Chabinyc Group, Chemical Engineering and Materials Research, The University of California, Santa Barbara
- Project: Design, build, and calibrate a doping chamber to dope thin film polymers via the vapor phase, integrate a quartz crystal microbalance, and accurately quantify the mass transfer
- Used UV-Vis spectroscopy, X-ray Photoelectron Spectroscopy and stylus profilometry
- Final report of this project can be viewed at this link: https://tinyurl.com/y3q8zgjb

ENGINEERING PROJECTS

1/2020 – 6/2020   **UCSB Chemical Engineering Senior Design Project,** Production of Ethyl Acetate Solvent via Green Technology
- Conceptual design of chemical plant. Included modeling reacting flows within a plug flow reactor using chemical kinetics in order to optimize reactor conditions, designing multicomponent distillation columns, building plant in Aspen HYSYS, and techno-economic assessment
- Final report of this project can be viewed at this link: https://tinyurl.com/yym3kg5y

1/2020 – 3/2020   **Advanced Process Control Final Project**
- Setup Model Predictive Control (MPC) and paired PID control on real multiple input and multiple output (MIMO) system
- Ran transfer function identification test on Arduino to estimate transfer functions of a real system

1/2020 – 3/2020   **Mechatronics Projects**
- Constructed a music spectrum analyzer that displayed the frequency and amplitude of an audio signal on an LED board in real time
- Built amplified thermocouple digital measurement system using an Arduino microcontroller

2/2018 – 3/2018   **Thermodynamics Design Project**
- Developed and coded an algorithm in MATLAB to run millions of efficiency calculations of a mobile steam power generator in order to determine the maximum efficiency
- Used X Steam to integrate steam-table data into MATLAB

DATA SCIENCE PROJECTS

9/2020 – 12/2020   **Reinforcement Learning** (Capstone Project) - https://github.com/ajclemens/reinforcement_learning
- Used openAI gym to train neural networks to solve the cartpole control problem in simulation
- Implemented two solutions: A Deep Q-Network (DQN) algorithm using keras, and a Neuroevolution of Augmenting Topologies (NEAT) genetic algorithm using neat-python

9/2020 – 12/2020   **Self-Driving Car AI** - https://github.com/ajclemens/self_driving_car_ai
- Used Udacity's driving simulator to train a deep neural network (convolutional neural network) to map car camera views to steering angles
- Implemented a custom loss function to tune the AI's driving behavior to be more human-like
- Trained models in the cloud using Google's cloud compute engine

TECHNICAL SKILLS

Python (Pandas, Numpy, Scikit-Learn, Matplotlib, Seaborn, TensorFlow, Keras), SQL, MATLAB, Cloud Computing (AWS, Google Cloud), Data Visualization, Machine Learning, Deep Learning, Reinforcement Learning, Deep Neural Networks, Git, Mathematica, C++, Java, Solidworks, Aspen HYSYS, Arduino prototyping (circuits/computer interfacing)