

Ali Hassanzadeh, Ph.D.

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Experience

Reinforcement Learning Scientist *Pathmind(Skymind), San Francisco, CA* Nov 19 - May 20

- **Optimization of Industrial Processes using Reinforcement Learning**

- Successfully Applied the Proximal Policy Optimization(PPO) Algorithm to reduce Electric cost an Australian factory by 18% compare to the baseline(random action)
- Industrial Process is simulated in a Modeling Software called AnyLogic and is exported as a Jar File
- Improved the backend bridge between Anylogic(Written in Java) to RLlib(written in Python)

Artificial Intelligence Fellow *Insight Data Science, San Francisco, CA* Sep 19 - Nov 19

- **Training Environment for Autonomous Vehicle using Reinforcement Learning**

Collaborated project with In-Q-Tel, Lab 41 (github.com/ahassanzadeh/RoboGym)

- Used **pixel and environment parameters** as the input to the Deep Reinforcement Learning model
- Applied a policy gradient model for continuous action space(*Proximal Policy Optimization*)
- Multi-agent training is completed using **AWS EC2-P2 xlarge instance** [training speed = 100K episode/hour]

Data Scientist *Digit, San Francisco, CA* May 19 - Aug 19

- **Purchasing Time and Value Prediction using Time Series**

A contracted data Science project for Digit (https://github.com/ahassanzadeh/Digit_Transactions_Prediction)

- **Project:** Forecast the Transactions time for for 375K customers
- **Outcome 1:** The frequency of the customers transactions for each customer evaluated separately and transaction dates are forecasted. **The accuracy of the algorithm with xgboost is 75% using Python**
- **Outcome 2:** The transactions' value are predicted using **LSTM with 80% accuracy**

Graduate Student Researcher *University of California, Merced, CA* Aug 15 - May 19

- **Solar Irradiation Forecasting**

- **Purpose:** Accurate prediction of annual solar irradiation is one of the major component to transform from fossil fuel to solar energy all around the world.
- **Dataset:** National Renewable Energy Lab's dataset include **20 parameters for 10 years** .
- **Machine learning methods:** Linear regression, Random Forrest, Naive Bayes, PCA and Gradient-BoostedRegressor(GBR) using Python .
- **Outcome:** The GradientBoostedRegressor(GBR) algorithm showed the best performance which could predict the solar irradiation for **the test dataset with 80% accuracy**.

- **A Novel Cooling Structure for Low Temperature Silicon Cells**

funded by California Energy Commission(CEC)

- Designed a novel cooling mechanism for silicon cells to maintain optimum temperature ($\leq 40^{\circ}C$)
- Modeled Electrical, Optical and Thermal performance using Finite Element Analysis
- Experimental data for silicone cell's performance are gathered and analyzed using **Python**

Technical Skills

- **Languages:** Python(3+ yrs), MATLAB(6+ yrs), C++/HTML/Java (≤ 1 yr)
- **ML Tools:** TensorFlow 1.x/2.x, Keras, PyTorch, Scikit-Learn, Numpy, Pandas
- **Engineering Tools:** AWS, Git, Streamlit

Education

Ph.D., Optimization - Renewable energy , <i>University of California, Merced, US</i>	May 2020
Master of Engineering, Mechanical Eng- Fluid Dynamic <i>Sharif Uni of Tech, Iran</i>	June 2015
Bachelor of Science, Mechanical Eng- Robotics <i>Mashhad University, Iran</i>	July 2013

Ph.D. Publications

* Correspondent Author

Bhusal, Y, **Hassanzadeh, A.***, Jiang, L., Winston, R. "[Technical and economic analysis of a novel low-cost concentrated medium-temperature solar collector](#)", Renewable Energy , vol. 146, pp. 968-985, July. 2019.

Hassanzadeh, A.*, Jiang, L., Winston, R. "[Coupled optical-thermal modeling, design and experimental testing of a novel medium-temperature solar thermal collector with pentagon absorber](#)", Sol. Energy, vol. 173, pp. 1248–1261, Oct. 2018.

Hassanzadeh, A., Widyolar, B., Brinkley, J., Kiran, S., Jiang, L., Diaz, G., Winston, R. "[Combined Solar Power and Heat for Electricity, Hot Water, and Space Heating](#)", UC Solar Symposium, San Francisco, USA, Oct. 2018. ([Audience choice poster winner](#))

Bhusal, Y., **Hassanzadeh, A.**, Winston, R. "[Optical-thermal modeling and experimental performance characterization of novel glass encased all glass evacuated tube solar collector](#)", UC Solar Symposium, San Francisco, USA, Oct. 2018. ([Audience choice poster winner](#))

Bhusal, Y., **Hassanzadeh, A.**, Winston, R. "[Ray tracing and heat transfer simulation of novel glass-covered XCPC collector](#)", SPIE conference, San Diego, USA, Sep.2018.

Hassanzadeh, A., Palko, J., Winston, R. "[Humidification/Dehumidification for Low Cost, Energy Efficient, Zero Liquid Discharge Desalination Using Solar Thermal Sources](#)", Alche conference, , Pittsburgh, USA, Oct.2018.

Hassanzadeh, A., Bhusal, Y., Winston, R. "[Coupled Optical and Thermal Modeling of Novel Solar Thermal Collectors](#)", COMSOL conference, , Boston , USA, Oct.2018.

Widyolar, B., Jiang, L., **Hassanzadeh, A.**, Winston, R. "[Compound Parabolic Concentrator for Pentagon Shape Absorber](#)", ISES Solar World Congress , Abu Dhabi, UAE, Nov.2017.

Hassanzadeh, A., Kiran, S., Jiang, L., Diaz, G., Winston, R. "[Novel Solar hybrid system for Producing heat and electricity](#)", UC Solar symposium, San Francisco, USA, Oct.2017.

Hassanzadeh, A., Widyolar, B., Jiang, L., Winston, R. "[The error tolerance of nonimaging optic systems](#)", SPIE conference, San Diego, USA, Sep.2017.

Brinkley, J. **Hassanzadeh, A.** "[Adaptive sensor-based ultra-high accuracy solar concentrator tracker](#)", SPIE conference, San Diego, USA, Sep.2017.

Hassanzadeh, A., Winston, R. "[Integrated Non-Tracking Solar Collector\(XCPC\) And Humidification Dehumidification\(HDH\) desalination System For Affordable Decentralized Potable Water production](#)", Davis, USA, Oct.2016.

Guo, H*, Muhammad Ali, H,**Hassanzadeh, A.**, Ma, Y. "[Simulation study of flat-sheet air gap membrane distillation modules coupled with an evaporative crystallizer for zero liquid discharge water desalination](#)", Appl. Therm. Eng., vol. 108, pp. 486–501, Sep. 2016.

Journal Reviewer

- American Society of Mechanical Engineers(ASME)