# Jed Homer

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**OBJECTIVE**

To research methods in artificial intelligence that can see beyond the perceptions of science today; for use in astrophysics, neuroscience and artificial intelligence itself. Whilst doing so I hope to inspire as many people as possible from all backgrounds to enter science by communicating my work in a creative and tangible way.

**EDUCATION**

***MSci Physics with Astrophysics***, September 2015 - Present
University of Glasgow, UK
Expected June 2020, predicted first class honours.

**UNIVERSITY COURSES**

***Year 5***

| | |
|---|---|
| MSci Masters Project | In Progress |
| Statistical Mechanics | In Progress |
| Electrodynamics, Relativity and Dynamics | In Progress |
| Plasma Theory and Diagnostics | In Progress |
| Statistical Astronomy | In Progress |

***Year 4***

| | |
|---|---|
| Astronomy Honours Project 2 | A3 |
| Mathematical Methods | A1 |
| Electromagnetic Theory | A5 |
| Cosmology and General Relativity | B2 |
| Nuclear and Particle Physics | A5 |

***Year 3***

| | |
|---|---|
| Astronomy Honours Project 1 | B1 |
| Galaxies | A2 |
| High Energy Astrophysics | A1 |
| Quantum Mechanics | A1 |
| Stellar Structure and Evolution | A3 |

**CODING**

*Languages:* Python (*Keras, Tensorflow*), MATLAB, Arduino, C++, Javascript.
*AI methods:* Generative Adversarial Networks (GANs), ACGANs, DCNNs, RNNs.

**EXPERIENCE**

***Masters Project*** September 2019 - Present
**'Teaching a machine to generate an artificial universe'**

- I used different GAN frameworks and simulation data preprocessing to create a generalised program capable of generating a virtual universe faster than the current methods in cosmological simulations.
- Implications for further research in astrophysics and cosmology.

***Summer Research Associate*** Summer 2019
**'High-redshift quasars and early Universe dark energy'**

Dark Cosmology Centre, Niels Bohr Institute, University of Copenhagen

- I worked with Dr. Darach Watson at the Cosmic Dawn Centre to create a fast correlation algorithm for two independent satellite missions to generate a large sample of high redshift quasars. This was to study early universe dark energy at a higher redshift than previous analyses.

***Astronomy Honours Project 2*** January - April 2019

**'Asteroid observations and photometrics'**

- Used Bayesian inference and wavelets analysis on frequency-domain pulsar time signals. This allowed an estimate of the lifetime and magnetic field strength of the Crab Pulsar.

***Astronomy Honours Project 1*** January - April 2018

**'Estimating the lifetime of the Crab pulsar'**

- I made a dynamic cross-correlation algorithm to track asteroids, distinguishing the object from background stars and recording photometric data.

## TEACHING

***The Python Argument Clinic*** Sept 2018 - Present

School of Physics and Astronomy, University of Glasgow

- I co-founded a class to teach Python to undergraduate students with Prof. Woan (UoG, IGR). We plan to extend into teaching machine learning techniques.
- I created purpose built Jupyter notebooks for teaching material. Hosted on official university teaching platforms.
- These resources are used for weekly workshops that teach scientific computing.

## OTHER

***Glasgow Night Shelter*** Sept 2019 - Dec 2019

- I volunteered at Glasgow Night Shelter for destitute asylum seekers. I did this because I think that a stronger connection between different groups in society is essential.

***Outsider Art Exhibition*** March 2015

- I exhibited paintings at the Candid Arts Trust, London as part of a group show.

## INTERESTS

*Fine Art* - My work looks into themes of mental health, human perception and biology. I am moving into installation using computational work that explores these ideas whilst communicating science and other less tangible phenomena.
*Climbing* - I regularly sport climb and boulder outdoors. It relies on intuition, patience and lateral-thinking.

## REFEREES

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