



Eleonora Parrag

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Astronomy (Data Intensive CDT)

Rewinding a Supernova with Machine Learning

About me:

I graduated from the University of Warwick with an first class MPhys degree in 2018.

Upon graduation, I worked for a year in industry, working mainly with the following:

- SQL and databases
- Basic powershell, xml, excel
- Testing software and applications
- Investigating and reporting bugs
- Working to deadlines

Outside of academic studies and interests, I am passionate about the outdoors and my main hobbies are hiking, cycling, and climbing

Science/ Research information:

The purpose of my PhD will be to create a tool (using machine learning) to reproduce and connect the difference stages of a supernova to its physics and the observable information. This will involve an extensive literature study of objects to use as a training set, then will be applied to a database of 7+ years of objects.

So far, I have written my own piece of code to recover the 'light curve' from images of a supernova.

I have also created code to fit to unusual data using my background knowledge of gaussian processes.

I am currently in the process of writing my first paper.

Skills and interests:

I have extensive experience coding in Python and SQL. As part of my PhD I regularly use pandas and numpy, as well as a range of astropy packages.

Machine learning experience:

- Using scikit-learn and xgboost to write Boosted Decision Trees/Gaussian Process/Linear Regression
- CDT modules which provided background knowledge of machine learning and data analysis

Additional computing skills which I aquired from the 'Coding Challenge' CDT remote group project such as:

- Creating and using a virtual machine (AWS, Microsoft Azure)
- Creating a Docker container for our code
- Reworking code to work with a GUI and creating a GUI using tkinter
- Using GitHub

Machine Learning Interests:

I would be particularly interested in working with Natural Language Processing or Neural Networks, as I would be excited to gain experience in these areas.

I am however open to any opportunities to extend my machine learning knowledge and skills.

Future goals and desires:

My motivation in transferring to a PhD from my industry position was the challenge and opportunity to expand my skills and knowledge. After my PhD, I hope to use the experience I have gained, particularly machine learning and data analysis, and apply these skills to industry.