JAKE MINNS

Address	Flat 8 Kirby's Heights, Station Road West, Canterbury, CT2 8FB
Email	jm2005@kent.ac.uk
Phone	(M) +447970434293
Website	http://jakeminns.github.io/

EDUCATION

PhD

2016-Present: Materials Physics, 2nd Year PhD Student, University of Kent, Canterbury.

Masters of Physics (MPhys)

2011–2016: First-Class Honours, University of Kent, Canterbury.

4th Year Research Project

Synthesis of hybrid halide perovskite and Rietveld refinement of neutron and x-ray powder diffraction data.

3rd Year Research Project

Simulation to determine the trajectories of electrons close to a magnetic monopole, written in Fortran 95.

PHD PROJECT DETAILS

Project Summary

Investigation into the structural dynamics of the hybrid perovskite $MAPbI_3$ and related compounds as well as the construction of perovskite based solar cell devices.

Relevant Data Experience

My PhD project focuses on the analysis of neutron TOF & x-ray powder diffraction data through Rietveld refinements using the software package Fullprof as well as structural determination obtained through single crystal x-ray diffraction (lab & synchrotron based) with ShelX, additionally the maximum entropy method has been applied to the above measurement techniques.

Publication

Structure and interstitial iodide migration in hybrid perovskite methylammonium lead iodide, J. L. Minns, et al. Nature Communications, 2017, 8, 15152.

TECHNICAL SKILLS

Languages

Python, Java, C++, Fortran 95, OpenSCAD, HTML/CSS & Latex.

3D Printing

Constructed an FDM based cartesian 3D printer and have a large amount of experience with SLA 3D printing.

Computer-Aided Design

Designed and 3D printed a large number of mechanical objects mostly through the CAD software package DesignSpark Mechanical including a wind turbine, fan nozzles, belt tensioners etc.

Miscellaneous Skills

Designed and constructed Arduino based projects. Basic electronics, soldering & carpentry skills.

RELEVANT PROGRAMMING PROJECTS

Machine Learning Classification

A feedforward neural network implementing the back-propagation method to classify various distributions of 3D data and extrapolate overall distributions. Written in C++ (Details at http://jakeminns.github.io/).

Machine Learning Competitive AI

Through a simple terminal based Tic Tac Toe game a variation of the minimax algorithm was implemented to produce a competitive agent. Written in C++.

Diffraction Image Manipulation

A program to manipulate and extract data from raw diffractometer images. Developed to remove background from single crystal diffuse scattering data, then expanded for data analysis allowing area and line intensity integration and plotting. Written in Python.

3D Printing of CIF Files

Software was developed to convert the common crystallographic file format CIF to the STL format for 3D printing. Written in C++/Python.

Android Development

A top 10 Scientific Calculator app (Pocket Scientific Calculator) was developed in Java through the Android studio IDE and Android SDK.

Miscellaneous Projects

VR crystal structure viewer. A number of Euler Project problems solved. Fullprof PCR file format parser for plotting of multiple .pcr file variables.

WORK EXPERIENCE

2016–2018 Graduate Teaching Assistant

University of Kent

- Python was taught to undergraduate physics students with the purpose of introducing the fundamentals of programming for data analysis.
- Myself and colleagues worked together to refine a new Python based module for undergraduate physicists.
- Undergraduate physics students were assisted through electronic circuit and Rutherford scattering experiments.

2009–2011 Skateboard Instructor

Swan Youth Center

- Worked in a team of 3–4 skateboard instructors to produce a series of instructive skateboard lessons.
- Clear and consistent communication was crucial to ensure the safety of young children throughout lessons.
- Successful organisation and communication of the lesson activities resulted in the children developing new skills.

REFERENCES

Professor Mark A Green
Primary PhD Supervisor
Head of School
University of Kent
M.Green@kent.ac.uk
+44 1227 823321

Dr George Dobre
Secondary PhD Supervisor
Sciences Associate Dean (Education)
University of Kent
G.Dobre@kent.ac.uk
+44 1227 823234

March 30, 2018