

Katy Louise Dobson

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Education:

- **2010 – Present ~ University of Leeds, ULTA-2.**
Studying for the University of Leeds Teaching Award Professional Standard 2.
- **2008 – 2010 ~ University of Leeds, ULTA-1.**
Passed the University of Leeds Teaching Award Professional Standard 1.
- **2003 – 2008 ~ University of Leeds, PhD.**
Dept: School of Computing,
Supervisor: Dr Patricia Hill,
Funding: The Frank Parkinson Scholarship,
Title: Grid Domains for Analysing Software.
The PhD studies for Oct 2006 – Sept 2007 were suspended due to ill health.
- **1999 – 2003 ~ University of Leeds, MMath (Hons) Mathematics, First Class.**
Project supervisor: Prof John Truss.
Final year project: Cohen's Method of Forcing.
Modules include Computability and Unsolvability, Number Theory, Graph Theory, Set Theory and Linear Algebra. I also participated in the postgraduate module Advanced Logic.
Finished top of my class for pure mathematics.
- **1996 – 1998 ~ Lawnswood Sixth Form, Leeds.**
'A' levels Mathematics (A), Further Mathematics (A), General Studies (C), Economics (E).
- **1992 – 1996 ~ Lawnswood High School, Leeds.**
10 GCSEs 5 grade A, 1 grade B, 4 grade C.

Employment:

- **2010 – Present ~ University of Leeds, Skills@Library.**
Maths Support Tutor.
My responsibility is to develop and co-ordinate mathematics support services to students and staff. This includes providing drop-in sessions, workshops and developing materials promoting mathematics.
- **2003 – Present ~ University of Leeds, School of Computing.**
Teaching assistant and private tutor.
My rolls have included designing and giving lectures for the modules Modelling, Analysis and Algorithm Design and Professional Development. Providing practical classes and coursework marking for several modules including Mathematics for Computing. Working on the admissions team, liaising with industry partners and degree development. I am also a private tutor for a student with Asperger syndrome.
Postgraduate Demonstrator.
Whilst undertaking my PhD I have been constantly involved in supervising undergraduate students in their practical classes and marking coursework. I have been involved in the modules Mathematics for Computing, Algorithms and Data Structures, Modelling, Analysis and Algorithm Design and Know your PC. At any one time I have been responsible for as many as 35 students.

- **1999 ~ Department for Work and Pensions, Fraud Department, Leeds.**
Administrative Assistant.

Roles included liaising with the police and Post Offices regarding fraudulent clients. Working with the investigative team in building the cases which involved searching databases and files for relevant information.

Other Experience and Skills:

- In 2006 I was invited to the University of Canterbury, Kent to give a talk entitled “Program analysis and the Grid Domain” and in 2005 I gave a talk at the University of Leeds entitled “The new grid on the block”.
- I have refereed papers for the European Symposium on Programming (ESOP) and for the Constraints in Software Testing, Verification and Analysis (CSTVA) workshop. Also I have attended conferences for the Static Analysis Symposium (SAS) and the Logic-Based Program Synthesis and Transformation (LOPSTR).
- I can use both Windows and Linux operating systems, I am experienced in the use of Latex, Emacs, Vim, OpenOffice and Word and I can program in C++.

Research Abstract:

My work explores the the world of static analysis using abstract interpretation. Static analysis is a method that can determine through approximation the behaviour of a program. Abstract interpretation then approximates the computations of a program by new computations over a domain which is known to be simpler. Specifically I am interested in the abstract domain of grids, a domain that is able to represent sets of equally spaced points and hyperplanes over an n-dimensional vector space. Such a domain is useful for the static analysis of the patterns of distribution of the values program variables can take. My colleagues and I have presented the domain, its representation and the basic operations on grids necessary to define the abstract semantics. We have shown how the definition of the domain and its operations exploit well-known techniques from linear algebra as well as a dual representation that allows, among other things, for a concise and efficient implementation. More recently I have been investigating abstract product domains which combine two or more abstract domains. I have especially been interested in those which have the grid domain as a component and ways in which to define their minimal representation.

Publications:

1. K. L. Dobson. Grid Domains for Analysing Software. PhD thesis, School of Computing, University of Leeds, August 2008.
2. R. Bagnara, K. Dobson, P. M. Hill, M. Mundell, and E. Zaffanella. Grids: A domain for analyzing the distribution of numerical values. In G. Puebla, editor, LOPSTR, 16th International Symposium, volume 4407 of Lecture Notes in Computer Science, Venice, Italy, 2007. Springer-Verlag, Berlin.
3. R. Bagnara, K. Dobson, P. M. Hill, M. Mundell and E. Zaffanella. A linear domain for analyzing the distribution of numerical values. Technical Report, number 2005.06, University of Leeds, School of Computing. Available at <http://www.comp.leeds.ac.uk/hill/Papers/papers.html>