Curriculum Vitae

Phillip Lord

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Career History

April 2002 - Present: Manchester University, Department of Computer Science, working on the ^{my}Grid project.

April 2001 - April 2002: Manchester University, Department of Computer Science, working on the IRBANE project, developing measures for Semantic Similarity.

Jan 2000 - April 2001: Manchester University, School of Biological Sciences, developing the CINEMA sequence alignment viewer.

1998 - 2000: Middlesex University/Institute of Child Health, developing the Photofit application.

Degrees

1993 - 1998: Ph.D. MRC Human Genetics Unit Edinburgh, investigating genes involved in centromere function in *Schizosaccharomyces pombe*.

1989-1992: B.A.(Hons) Natural Sciences/Genetics 2:1 Trinity College, Cambridge.

Research Statement

My research career has been in the overlap between **biology and computer science**, fostering communication between these communities to the benefit of both. Ideas from computer science need to be implemented and tested against real world problems to ensure their validity and usefulness. Biology and Bioinformatics need cutting edge solutions to the problems of structuring, searching and manipulating large quantities of complex and heterogeneous data.

My research has focused on **knowledge representation** technologies, including formal ontology languages such as OWL, developed by the **Semantic Web** Community, and the **Gene Ontology** (GO), developed by the model organism communities. This work has also been combined with work on the **Grid**, and Semantic Grid technologies. In this work, I have placed an emphasis on developing and freely releasing well-engineered software, with **highly usable interfaces**, to ensure the maximum uptake of the research and generated technologies within the biological community.

The use of knowledge representation technologies within Bioinformatics is limited by their presentation; biologists should not need to understand logic to use OWL to describe their data. In my future research, I would like to enhance the presentation of formal languages, such as OWL, by providing simplified views, while demonstrating ways in which extensions less formal representations, such as GO, can be extended to benefit the user. To this end, I am currently reworking the ^{my}Grid ontology, so enable it's release in OBO (Open Biological Ontologies) style. This work has already attracted interest from other researchers internationally.

During my time at Manchester, I have developed and extended the skills that I need to carry out such **collaborative work**, maintaining active links with people such as Mark Wilkinson, Damian Gessler, and Lincoln Stein from the BioMOBY project; this resulted in a recent **joint publication** of which I am the primary author. I've also continued with my career-long task of "translating" between biologists and computer scientists enabling each to understand the requirements of the other; work which has resulted in my recent contribution to a number of **successful or submitted grants**. I have also increased my international reputation with a number of **invited talks**, and as **Co-Chair of the Annual Bio-Ontologies Meeting** at ISMB 2004.

Current and Previous Projects

April 2002 - Present: The ^{my}Grid project

- This project, part of the UK e-Science program, is aimed at enabling access to complex heterogeneous data through a Service Orientated, Grid architecture.
- We have developed services, workflow engines and development environments which enable the end biologist to compose these services together to perform various analyses, over information such as genomic DNA, and micro-array expression data.
- By providing Semantic descriptions of the services, we have enabled this composition, and subsequently the browsing of these results.
- We are currently investigating further integration and visualisation of these results. Additionally, we will release an OBO

ontology as described earlier.

April 2001 - April 2002: The Irbane project

- I applied measures for "semantic similarity" to the Gene Ontology, which are both useful for searching and validating GO annotated databases.
- Following our publications, a number of groups internationally are applying, extending or developing alternatives to, these measures.

Jan 2000 - April 2001: CINEMA

- Developed a large Java application for viewing, editing and interacting with multiple sequence alignments.
- This work lead, in part, to current projects at Manchester on enhanced visualisation techniques for bioinformatics.

1998 - 2000: The Photofit

- Developed an application to enable an image query over a large database of Dysmorphic Patient data.

Teaching Statement

While the majority of my career has focused on research, I have gained significant experience in teaching. As a member of the senior post-doctoral staff, I have also been responsible for the **development of PhD projects** on techniques for semi-automated workflow composition, and the **day to day management** of more junior staff working on technologies for service discovery. As well as **supervising** many MSc and undergraduate students from both Biological and Computer Science backgrounds. I have a **wide experience** in both formal and informal **presentations**, both in a research context and as tutorials to both students and other researchers.

I have also given recent lectures in Manchester's Bioinformatics MSc on the problems of interoperability and heterogeneity, and previously at Middlesex on advanced Java Programming as part of a Computer Science BSc.

My background in Biology, Bioinformatics and Computer Science means that I am capable of teaching on a **wide variety of subjects**, to students from **many different educational backgrounds**. I look forward to extending my skills in this area.

Publications

Papers in Refereed Journals

C. Wroe, C. Goble, M. Greenwood, P. Lord, S. Miles, J. Papay, T. Payne, and L. Moreau. Automating experiments using semantic data on a bioinformatics grid. *IEEE Intelligent Systems*, 19(1):48–55, 2004

P.W.Lord, R. Stevens, A. Brass, and C.A.Goble. Investigating semantic similarity measures across the Gene Ontology: the relationship between sequence and annotation. *Bioinformatics*, 19(10):1275–83, 2003

R. Stevens, C. Wroe, S. Bechhofer, P. Lord, A. Rector, and C. Goble. Building ontologies in DAML + OIL. *Comparative and Functional Genomics*, 4(1), 2003

P.W.Lord, J.N.Selley, and T.K.Attwood. CINEMA-MX: A modular multiple alignment editor. *Bioinformatics*, 18(10):1402–03, 2002

Papers at Refereed Conferences

S. Bechhofer, R. Stevens, and P. Lord. Ontology driven dynamic linking of biology resources. In *Pacific Symposium on Biocomputing*, page *in press*, 2005

P. Lord, S. Bechhofer, M. D. Wilkinson, G. Schiltz, D. Gessler, D. Hull, C. Goble, and L. Stein. Applying semantic web services to bioinformatics: Experiences gained, lessons learnt. In *International Semantic Web Conference*, 2004. Accepted For Publication

R. Stevens, H. Tipney, C. Wroe, T. Oinn, M. Senger, P. Lord, C. Goble, A. Brass, and M. Tassabehji. Exploring Williams Beuren Syndrome Using ^{my}Grid. In *Bioinformatics*, volume 20, pages i303–310, 2004. Intelligent Systems for Molecular Biology (ISMB) 2004

P. Lord, C. Wroe, R. Stevens, C. Goble, S. Miles, L. Moreau, K. Decker, T. Payne, and J. Papay. Semantic and personalised service discovery. In *Proc UK e-Science All Hands Meeting 2003*, pages 787–794. EPSRC, 2003. ISBN 1-904425-11-9

S. Bechhofer, R. Volz, and P. Lord. Cooking the semantic web with the OWL API. In *Internaional Semantic Web Conference*, pages 659 – 675, 2003

P. Lord, R. Stevens, A. Brass, and C. Goble. Semantic similarity measures as tools for exploring the Gene Ontology. In *Pacific Symposium on Biocomputing*, pages 601–612, 2003

P. Lord, J. Reich, A. Mitchell, R. Stevens, T. Attwood, and C. Goble. PRECIS: An automated pipeline for producing concise reports about proteins. In *IEEE International Symposium on Bio-informatics and Biomedical engineering*, pages 59–64. IEEE press, November 2001

Books

P. Lord, R. D. Stevens, C. A. Goble, and I. Horrocks. Description Logics: OWL and DAML+OIL. In *Genetics, Genomics, Proteomics, and Bioinformatics*. Wiley, 2004. Invited Article In Press

R. Stevens, C. Wroe, P. Lord, and C. Goble. Ontologies in bioinformatics. In S. Staab and R. Studer, editors, *Handbook on Ontologies*, pages 635–657. Springer, 2003

Invited Presentations

P. Lord. Migrating to the Semantic Web: Bioinformatics as a case study. The First European Workshop on Semantic Web Applications in Biomedicine, 2004. Balatonfüred, Lake Balaton, Hungary

P. Lord. Knowledge in Middleware for *in silico* Biology. AgentLink III Technical Forum:- Agents in Bioinformatics., 2004. Rome, Italy

P. W. Lord. Semantic Similarity:- Measuring Similarity across the Gene Ontology. GO Users Meeting, 2002. Hinxton, UK

Professional Activities

Oct 2004 Programme Committee: First International Workshop on Grid Computing and its Application to Data Analysis (GADA '04)

Sept 2004 Programme Committee: First International Workshop on Scientific Applications on Grid Computing (SAG '04)

July 2004 Chair of the Seventh Annual Bio-Ontologies Meeting, organised as a Special Interest Group at ISMB

Reviewed numerous papers for leading journals, such as Bioinformatics, J. Parallel and Distributed Computing, IMIA Yearbook of Medical Informatics, and conferences including ISMB (2004-2004), PSB(2004-2005), ISWC (2003-2004), SIGMOD (2004), and many workshops.