Ryan M Harrison

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Education

University of Oxford (Oxford, UK) — Expected Sept 2014
DPhil in Computational Biophysics
Thesis: Coarse-grained modelling of extreme DNA bending

- NIH-Oxford Scholar — 2010
- National Science Foundation Graduate Research Fellow — 2010

Johns Hopkins University (Baltimore, MD) — Dec 2009
Bachelor of Science in Biomedical Engineering; Minor in Economics. GPA: 3.26/4.00

- Inductee, National Gallery for America's Young Inventors — 2006
- 5th Place, Intel Science Talent Search — 2005

Danish Institute for Study Abroad (Copenhagen, Denmark) — Aug – Dec 2009
International Business Program.

Skills

Scientific software developer

Speciality	Force-field based biomolecule simulation Rare-event methods for Monte Carlo and MD
Languages	`Python`, `C++`, Shell (awk/bash/sed), LaTeX `MATLAB`, `Perl`, `R`, `Ruby` (Past projects)
Packages	`numpy`, `matplotlib`
Toolchains	Linux (GNU tools with Make/Cmake) Microsoft (`VisualStudio`)
Documentation	`Doxygen`, `Markdown`
Versioning	`svn`, `git`
Ask about	Refactoring and testing scientific code

Competent bench scientist

Molecular Bio.	End-to-end protein work Molecular cloning, site-directed mutagenesis, cell culture, protein expression & purification (FPLC)
Biochemistry	Protein quality-control and enzyme kinetics Mass (ESI, MALDI) and Optical (absorbance, fluorescence) spectrometry Expression profiling (real-time PCR), 1D NMR
Microscopy	Single-molecule flourescence on TIRF and confocal

Experience

Industry

NaturalMotion (Oxford, UK) — Summer 2013

- Improved procedural character animation by blending input animations with inverse-kinematics. Communicated results through non-technical live-demos.
- Agile development in `C++` with Microsoft toolchain.

Ginkgo BioWorks (Boston, MA) — Jan – May 2010

- Developed `Django` and `Rails` apps for prototyping engineered biological systems.
- Collaborated with bench scientists to integrate software into high-throughput plasmid assembly pipeline, including liquid handling robotics and LIMS.
- Exceeded software milestones for payments from industrial partner.

Ion Torrent Systems (Guilford, CT) — Summer 2009

- Conducted system optimization on Ion PGM, a next-gen sequencing prototype.
- Wrote desktop `Pyjamas` app to track improvements in system performance.

Academic

Graduate Research Assistant (Oxford, UK) 2010–Present

- Molecular simulation of DNA
  - Spearhead integration testing to reduce scientific and build errors.
  - Simulation software maintenance in `C++`; analysis suite in `Python`.
- Single-molecule fluorescence on DNA helicase
  - Site-specific protein double labeling and single-molecule flourescence.
  - Image processing and time series analysis with `MATLAB`.

Organic Polymer Chemist (Tsukuba, Japan) 2008

- Invented a total synthesize for a novel insulated conducting polymer (polythiophene backbone with an intra-molecular rotaxane sheathing).

Proteomics Research Developer (Baltimore, MD) 2003 – 2007

- `C++` developer for Rosetta protein structure suite. Analysis tools with `Perl` and `R`.
- Implemented model of pH-sensitive regions within proteins.

Academic

Publications

Harrison RM, Romano F, Ouldridge TE, Louis AA, Doye JP. Coarse-grain modelling of extreme DNA bending I: Molecular-vice. In preparation.

Harrison RM, Romano F, Ouldridge TE, Louis AA, Doye JP. Coarse-grain modelling of extreme DNA bending II: Cyclization. In preparation.

Doye JP, Ouldridge TE, Louis AA, Romano F, Šulc P, Matek C, Snodin BE, Rovigatti L, Schreck JS, *Harrison RM*, Smith WP. Coarse-graining DNA for simulations of DNA nanotechnology. Physical Chemistry Chemical Physics 2013;15(47):20395–20414.

Sugiyasu K, Honsho Y, *Harrison RM*, Sato A, Yasuda T, Seki S, Takeuchi M. A Self-Threading Polythiophene: Defect-Free Insulated Molecular Wires Endowed with Long Effective Conjugation Length. J. Am. Chem. Soc. 2010 Sep.

Software contributions

Kilambi KP, Gray JJ. Rapid Calculation of Protein pKa Values Using Rosetta. Biophysical Journal 2012 Aug;103(3):587–595.

Recent Talks

Theoretical Chemistry Group Graduate Student Meeting, London, 30 Apr 2014.
Softbio Day, Oxford Center for Soft and Biological Matter, Oxford, 17 Apr 2013.

Recent Posters

CECAM: Biological molecules under non-natural conditions, Stuttgart, 10–12 Mar 2014
National Institutes of Health Research Fesival, Bethesda MD, 9–12 Oct 2012

Technical Skills Training

CECAM Molecular Simulation Course 6–18 Jan 2013
Marine Biological Lab Optical Microscopy Course 11–21 Oct 2011

Extracurricular

Facebook London Hackathon (Honorable mention) Apr 2013
Saïd Business School Building a Business Course 2012/2013
University of Oxford Student Consultancy Winter 2013
Mid-Atlantic Biotech Conference (Volunteer) Sept 2012
Mid-Atlantic Venture Association Capital Connection (Volunteer) May 2012
NIH Science Policy Group 2011/2012

Hobby

Bow tie maker • Allotment gardener • Theater light tech