Wojciech KOZLOWSKI

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Nationality: Polish (EU)

Research and Work Experience

Postdoctoral Researcher – QuTech, TU Delft, Netherlands **01/02/2019 – Present**

- Returned to academia to combine industry experience in computer networking with previous research experience in quantum information.
- Work on developing software and network architecture for quantum networks with particular focus on end-to-end connectivity protocols and potential network operator use cases.
- Actively interact with engineers from the networking industry as **co-chair of the Quantum Internet Research Group** (QIRG) at the IRTF.
- Organise and participate in outreach activities such as Science is Wonderful! 2019 in Brussels.
- **Teaching:** Supervision of computer science and physics research students.

Senior Software Engineer (Developer) – Metaswitch, London, UK **03/10/2016 – 31/12/2018**

- Pursued industry career to explore personal interest in computer science topics.
- Worked in the protocols team developing a Hardware Abstraction Layer (HAL) for the Metaswitch layer 2 and layer 3 control plane software.
- Senior engineer within the IP/MPLS HAL integration project. Protocols worked on include OSPF, IS-IS, BGP, LDP, RSVP, BFD, and LSP Ping. Use cases covered include L2VPN (VPLS and VPWS), L3VPN, and RSVP end-to-end protection.
- Wrote and tested Broadcom data plane integration code for layer 2 protocols, such as ERPS, STP, LACP, and LLDP, as well as interface management and quality of service functions.
- Member of winning team at company's November 2016 (microservices to replace existing product using much less code) and May 2017 (predictive CLI using machine learning) hackathons.
- **Teaching:** Lead for C++ adoption in the network protocols unit which began transitioning from C shortly before I arrived. This includes mentoring of both novice and experienced programmers and leading a weekly training session. Additionally, mentored new starters on a daily basis.

PhD Researcher – Atomic and Laser Physics, University of Oxford, Oxford, UK **01/10/2012 – 30/09/2016**

- **Thesis:** Competition between weak quantum measurement and many-body dynamics in ultracold bosonic gases.
- **Supervisor:** Dr. Igor B. Mekhov.
- Theoretical study of nondestructive measurement of ultracold gases using quantised light with the aim of proposing new methods for quantum metrology and control.
- Came up with new methods for preparing quantum states using measurement, showed that weak measurement can be effectively used to create new entangled states and dynamics, derived new effective Hamiltonian and master equation for dynamics in quantum Zeno regime.
- Research experience in quantum measurement, quantum trajectories, quantum optics, many-body strongly correlated systems, optical lattices, multipartite entanglement, quantum Zeno effect and dynamics.
- **Teaching:** Tutor for 1st year mathematics course and 3rd year atomic physics course. This included weekly 2-to-1 and 3-to-1 tutorials, additional exam preparation as well as marking assignments and mock exams.

Education

MSci, Natural Sciences, University of Cambridge, Cambridge, UK **06/10/2008 – 06/07/2012**

- **Class I** result overall – highest possible grade. **Class I** result in each individual year as well.
- Churchill College and Bullard Prize scholarships awarded each year for excellent results.
- **Thesis:** Theoretical and numerical study of models of entanglement for neutrons.
  - **Supervisor:** Prof. Crispin H. W. Barnes.
  - Theoretical study of the potential to use entangled neutrons to detect gravitational waves. Showed that in principle it is possible, but micro-trap size makes it practically infeasible.
  - Microsoft Research Prize awarded for best computational project in the year.
- Courses included: quantum information, atomic physics, quantum optics, quantum condensed matter physics, quantum field theory, quantum condensed matter field theory, special and general relativity, thermal and statistical physics, astrophysical fluid dynamics, biological physics, soft condensed matter.

The Centre for Computational Science, UCL, London, UK **13/06/2011 – 02/09/2011**

- Summer project on computational fluid dynamics.
- Computational study of feasibility of entropic Lattice-Boltzmann method for fluid simulations as compared to normal Lattice-Boltzmann method. Demonstrated increased numerical stability, but at a significant performance cost.
- **Supervisor:** Prof. Peter V. Coveney.

John Innes Centre, Norwich, UK **05/07/2010 – 27/08/2010**

- Summer project in computational systems biology.
- Computational study of effect of chemical buffers on calcium concentrations used in signalling pathways in plant cells. Demonstrated that buffer concentrations can be used to explain many so far unexplained experimentally observed patterns.
- **Supervisor:** Prof. Richard J. Morris.

Additional information

Google Science Fair **2014, 2015, 2016**

- Preliminary judging of about 100 contest entries in multiple languages (English, French, Polish) followed by scientific accuracy checks of about 8 projects that qualified.

Peer Support, St. Catherine’s College, Oxford, UK **06/10/2014 – 30/09/2016**

- Part of University’s welfare provision of day-to-day support from peers.
- 30 hours of formal training in effective listening and communication.

MCR President, St. Catherine’s College, Oxford, UK **01/04/2013 – 31/03/2014**

- Led and managed a nine person committee responsible for representing the college's postgraduates (300+ students) and organising social activities.
- Managed a budget of about £12,000 p.a. together with the treasurer.

MCR Bar Manager, St. Catherine’s College, Oxford, UK **29/10/2012 – 31/03/2013**

- Managed a team of about ten volunteers and paid workers during larger social events.
- Created and managed a volunteer scheme to help with bar duties.

Awards and scholarships

Hackathon Prize, Metaswitch **11/11/2016**
- Awarded for best projects in the hackathon's special theme category (micro-services in Nov 2016 and machine learning in May 2017). **12/05/2017**

Research Student Conference Fund, Institute of Physics **01/06/2015**
- Grant to partially cover travel costs to Atomic Physics 2015 in the US.

Leatherseller's Company Scholarship, St. Catherine's College, Oxford **01/10/2014 – 30/09/2015**
- Scholarship awarded to exceptional graduate students of the college.

Light Senior Scholarship, St. Catherine's College, Oxford **01/10/2013 – 30/09/2014**
- Scholarship awarded to exceptional graduate students of the college.

2 x Departmental Travel Award, Clarendon Laboratory, Oxford **01/09/2013**
- Grants to partially cover travel costs to Les Houches Summer School 2013 in France, Atomic Physics 2015 in the US. **01/06/2015**

3 x Graduate Expenses Fund, St. Catherine's College, Oxford **01/03/2013**
- Grants to partially cover travel costs to Young Atom Opticians 2013 in the UK, Les Houches 2013 in France, Atomic Physics 2015 in the US. **01/09/2013** **01/06/2015**

PhD Scholarship, Engineering and Physical Sciences Research Council **01/10/2012 – 30/09/2016**
- Grant to cover living and tuition fee costs for the PhD degree at the Physics Department at the University of Oxford.

Microsoft Research Prize, Department of Physics, Cambridge **06/07/2012**
- Award for best computational physics MSci project in the year.

2 x Bullard Prize Scholarship, Churchill College, Cambridge **30/06/2011**
- Award for best results in physics in college. **30/06/2012**

4 x Churchill College Scholarship, Churchill College, Cambridge **30/06/2009**
- Award for Class I result. **30/06/2010** **30/06/2011** **30/06/2012**

Technical skills

Programming languages

- **Advanced:** C++, C, Python
- **Intermediate:** Rust, Bash, Java, Lisp
- **Basic:** Perl, JavaScript, HTML5, CSS3

Frameworks, tools, operating systems

- Linux, Git, GitLab (admin, proj. mgmt. , CI/CD, registry), LaTeX, Docker, Podman