VOLKER SEEKER

EDUCATION

University of Edinburgh, UK **PhD in Computer Science** **Nov 2011 - Dec 2016**

Thesis: User Experience Driven CPU Frequency Scaling on Mobile Devices Towards Better Energy Efficiency

- developed a record and replay mechanism to deterministically replay realistic interactive Android workloads on the same/another mobile device with a micro second accuracy
- developed a mechanism to **automatically detect user interaction lag** based on nonintrusive analysis of video output and device event queues with a **speedup of 2700x compared to manual detection**
- identified **energy saving potential of up to 27%** whilst delivering a better user experience than the current standard Android CPU frequency governors
- developed a **reinforcement learning based CPU frequency governor** for interactive Android workloads which achieved up to **22% energy savings compared to current mobile solutions** whilst providing a fluid user experience
- developed a simulator for interactive Android workloads with **simulation speeds up to 100x faster than real time**
- **Best Paper Award** for publication at IISWC 2014 conference

Technical University Berlin, Germany **BS/MS Computer Engineering** **Oct 2005 - May 2011**

Graduated with Distinction

Thesis: Design and Implementation of an Efficient Instruction Set Simulator for an Embedded Multi-Core Architecture

- extended existing instruction set simulator code base to allow **multi-core architecture simulation** by synchronising and managing the code interpretation and execution on multiple core instances
- final simulation speeds went up to 25,307 Mips on a 32-core x86 host for as many as **2048 simulated cores**
- Won the UK wide **Science Engineering and Technology Student of the Year Award 2011** for Msc thesis
- Published corresponding papers at the **IC-SAMOS'11 conference** and in the **IJPP'12 journal**

EMPLOYMENT

Research Associate **University of Lancaster** **May 2016 - June 2017**

- developed client and server side applications to **distribute execution of OpenCL kernels to multiple servers**
- used **machine learning model to map OpenCL execution** to most energy efficient and lowest latency execution devices

Co-Founder, Developer **Brightside Games UG, Berlin** **Jun 2009 - Feb 2010**

- successfully presented the business idea to gain an **EXIST Business Start-up Grant worth 63,000 €** from the German government, office space and a collaboration with the international production house RCP in Munich
- drove the agile project management for the Xbox 360 game Zeit^2 which lead to **successful publication by Ubisoft**
- implemented content loading pipeline, XML-interface to level editor, localisation, menu screens, game state transitions and various parts of the game logic
- optimised the C# code base to cope with Xbox 360 garbage collection using object pooling and other techniques

Software Developer **Bit-Side GmbH, Berlin** **Oct 2007 - May 2009**

- developed modules for decoding and processing signals based on the energy efficient EnOcean wireless protocol for embedded automation software which controls lights, window blinds and ventilation systems
- developed a **machine learning algorithm to control radiator valves** by using features such as past and present room temperature, weather reports and room occupancies

TECHNICAL EXPERIENCE

Projects

- **Machine learning based CPU Frequency Governor** (2015 – 2016). Reinforcement learning based CPU frequency governor for Android mobile devices executed on an Android workload simulator. Java, R, Bash
- **Benchmarking Interactive Android Workloads** (2012-2013). Toolchain to automatically benchmark user experience and CPU energy consumption for interactive Android workloads. C, Java, Python, R, Bash
- **Instruction Set Simulator** (2011). Just in time compilation driven instruction set simulator for ArcCompact ISA. C++
- **Xbox 360 Game** (2008 – 2010). Fast paced Xbox 360 Shoot 'em up game with time travel mechanics. C#

ADDITIONAL EXPERIENCE AND AWARDS

- **Student Supervisor** (2016). Mentored student during summer project on writing a GUI for benchmarking framework
- **Programming Club** (2016). Led a weekly club to help students gain more practical programming experience
- **Awarded one of 14 yearly HiPEAC Collaboration Grants** (2013). Worth £5k for collaboration with Critical Blue, Edinburgh
- **Awarded Industrial CASE studentship by EPSRC and ARM** (2011). PhD funding and research collaboration for four years
- **Winner Founders Competition – Multimedia** (2009) for the business startup Brightside Games, Berlin