

## Justin Funston, PhD

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CONTACT *Mobile:* 1-360-670-3372  
INFORMATION *E-mail:* [justinfunston@gmail.com](mailto:justinfunston@gmail.com)

SKILLS

- High performance networking: RDMA and dpdk technologies
- Kernel-level programming in Linux and Solaris
- C++, C, and Python proficiency
- Performance analysis with tools such as Intel Pin and Linux perf
- Machine learning – regression, classification, and clustering

EXPERIENCE **Senior Software Engineer** Jan. 2018 to Present  
**Futurwei Technologies**

- Working on next generation cloud storage distributed systems
- Personally responsible for low-latency networking subsystem
  - Implemented kernel bypass technologies: RDMA and dpdk
- Implemented cluster load balancing and re-partitioning policies

**Research Assistant** June 2010 to Dec. 2017  
**University of British Columbia**  
**Simon Fraser University**

- Invented a thread scheduling algorithm for large multi-core systems
  - Used scikit-learn to predict the performance of thread placements
- Researched the performance effect of huge pages in NUMA systems
- Implemented page-level data replication in the Linux kernel
  - Code: [github.com/Carrefour/linux-replication](https://github.com/Carrefour/linux-replication)
- Experimentally investigated database performance on NUMA systems
- Developed a cache simulator to better understand cache behavior
  - Code: [github.com/jfunston/MultiCacheSim](https://github.com/jfunston/MultiCacheSim)

**Software Intern** May 2014 to Aug. 2014  
**Oracle**  
**Solaris RPE Group**

- Added consideration of core power states to the Solaris scheduling algorithm
- Implemented and tested my changes in the Solaris kernel

**Research Intern** June 2013 to Aug. 2013  
**Microsoft Research**  
**Distributed Systems Lab**

- Invented a model for characterizing the performance of distributed systems
- Validated the model on various platforms

**Research Intern** June 2012 to Nov. 2012  
**Oracle Labs**

- Implemented a NUMA traffic control algorithm in the Solaris kernel
- Tested and improved a separate user-level NUMA balancing algorithm
- Developed a Linux kernel module for supporting Intel PEBS

**Research Intern** June 2011 to Aug. 2011  
**IBM T.J. Watson Research Center,**  
**Scalable Systems Group**

- Devised a metric to predict SMT performance of multi-threaded applications
- Confirmed the validity of the metric through experimental data

**Research Assistant** Sept. 2007 to May 2010  
**Gonzaga University**  
**Computer Science Department**

- Worked on a project to reduce the latency of TCP
- Designed and implemented changes to the TCP stack of the Linux kernel
- Planned the interface between the NIC and the driver

**EDUCATION** **PhD, Computer Engineering** Feb. 2018  
**University of British Columbia, Vancouver BC**  
• Supervisor: Dr. Alexandra Fedorova

**B.S. in Computer Science** May 2010  
**Gonzaga University, Spokane WA**

- PUBLICATIONS**
- [1] Funston, J., et al. Placement of Virtual Containers on NUMA systems: A Practical and Comprehensive Model. *USENIX ATC*. 2018.
  - [2] Lozi, J. P., Lepers, B., Funston, J., Gaud, F., Quema, V., Fedorova, A. Your Cores Are Slacking Off—Or Why OS Scheduling Is a Hard Problem. *USENIX ;login:*, Vol. 41 No. 4. 2016.
  - [3] Lozi, J. P., Lepers, B., Funston, J., Gaud, F., Quema, V., Fedorova, A. The Linux Scheduler: A Decade of Wasted Cores. *11<sup>th</sup> European Conference on Computer Systems (Eurosys)*. 2016.
  - [4] Gaud, F., et al. Challenges of Memory Management on Modern NUMA Systems. *Communications of the ACM*, 58(12), 59-66. 2015.
  - [5] Gaud, F., Lepers, B., Decouchant, J., Funston, J., Fedorova, A., Quema, V. Large Pages May Be Harmful on NUMA Systems. *USENIX ATC*. 2014.
  - [6] Dashti, M., Fedorova, A., Funston, J., Gaud, F., Lachaize, R., Lepers, B., Quema V., and Roth, M. Traffic Management: A Holistic Approach to Memory Placement on NUMA Systems. *ASPLOS*. 2013.
  - [7] Funston, J., Maghraoui, K., Jann, J., Pattnaik, P., and Fedorova, A. An SMT-Selection Metric to Improve Multithreaded Applications' Performance. *26<sup>th</sup> IEEE International Parallel & Distributed Processing Symposium (IPDPS)*., pp. 1388–1399. 2012.
  - [8] Bergman, M., Funston, J., and Crowley, P. Low-Cost Compute Clusters in Virtualized Lab Environments. *Journal of Computing Sciences in Colleges.*, 25(1):159–166. 2009.