CURRICULUM VITÆ

Cyrus P. Hall

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Department of Informatics
University of Lugano
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Professional Interests

Sensor Network Communication Protocols; Communication Networks and Services; Distributed Publish/Subscribe Systems; Distributed Systems Engineering; Enabling and Simplifying Human Communication via Computer Networks; Computer Security;

Education

M.S.	Computer Science
December 2004	University of Colorado. Boulder, Colorado, USA.
B.S.	Computer Science
May 2002	University of Colorado. Boulder, Colorado, USA.

Professional Experience and Service

Appointments

Spring 2004–present — *Doctoral Candidate*, Department of Informatics, University of Lugano.

Currently prosuing further study of routing in sensor networks while considering methods to add reasoning capabilities to networks.

Spring 2003–Fall 2004 — *Research Assistant*, Department of Computer Science, University of Colorado.

Designed and implemented DV/DRP, a content-based networking protocol for sensor networks, on the MANTIS OS platform. Redesigned and ported Siena Fast Forwarding, a content-based forwarding algorithm, to the Intel IXP 1200, a first generation network-processor.

Teaching

Fall 2004–present — *Teaching Assistant*, Department of Informatics, University of Lugano.

Various classes.

Spring 2000–Fall 2002 *Teaching Assistant*, Department of Computer Science, University of Colorado.

CSCI-2270 Computer Science 2: Data Structures

Teaching assistant for the required second-semester Computer Science course. Duties included preparing and teaching both recitation and lecture, conducting discussion sessions and lab time, preparing and evaluating homework assignments, writing and grading exams, and advising students on their homeworks and projects.

Fall 1999 *Teaching Assistant*, Department of Computer Science, University of Colorado.

CSCI-1300 Computer Science 1: Programming

Teaching assistant for the required first-semester Computer Science course. Responsible for preparing and teaching recitation, preparing and evaluating homework assignments, and grading exams.

Publications

Thesis

- C.P. Hall "A Content-Based Networking Protocol For Sensor Networks". August 11, 2004

  University of Colorado

Tech Reports

- C.P. Hall, J. Rose, A. Carzaniga, and A.L. Wolf "Implementing Content-Based Communication in Sensor Networks".

  University of Colorado

- D. Clements, C.P. Hall, R. Gray "Vulnerabilities in 802.11 Networks: Problems and Solutions". April 4, 2002

  FRUUG, University of Colorado

Consulting

Boulder Labs *Fall 2000–Fall 2003* Designed and implemented multiple systems, ranging from the command and control of embedded applications, to a video-on-demand markup language and interpreter. Explored wireless security issues, including expanding the functionality of dstumbler, dwepcrack, and other 802.11 WEP tools.

GW Hannaway and Associates *Summer 2000* Ported an IRIX SCSI print driver to the Linux generic SCSI framework. Redesigned and deployed both internal and external network to increase security, monitoring, and redundancy.

Software Systems

DV/DRP *2003–present* A content-based forwarding and routing protocol for sensor networks. DV/DRP focuses on reducing the power usage needed to implement the publish/subscribe paradigm in constrained environments, while offering a fault tolerant and best-effort transport layer. Routing and forwarding use the content of messages, rather than explicit addresses, to dynamically restrict the final receiver set. Messages are only forwarded if they are wanted elsewhere in the network. *Dynamic Receiver Partitioning* (DRP) eliminates the need for flooding, and marks packets to be forwarded along

shortest-path spanning trees, rooted at receivers. A low-energy, best-effort recovery algorithm attempts to forward packets that encounter broken spanning trees.

SFF-NP
2003-present
A redesigned version of Siena Fast Forwarding (SFF), a content-based forwarding algorithm, for the Intel IXA framework. The core SFF algorithm on the network processor is parallelized across multiple micro-engines, and each micro-engine's thread. Supporting data structures are completely redesigned and modified for quick and contention-free access by the parallelized algorithm.

MC Penguin
2001–2002
A full-featured television personal video recorder, similar to TIVO, implemented on Linux 2.4. MC Penguin is implemented as a multi-process framework, controlled by the *Master Control Daemon* (MCD). A light-weight publish/subscribe framework provides inter-process communication between processes controlled by the MCD. The MCD is implemented as a micro-application, whose whole purpose is to pass messages and restart failed framework processes in a manner transparent to the user.

Lavaundry Chef
2000–2002
An infrastructure to enable command and control of industrial laundry machines. The Chef consists of a application wrapped around a TCL interpreter and a command and control language implemented as an extension to TCL. After Chef receives instructions from either a script or live user, it translates them into individual commands for both micro-controllers and motors on a given laundry machine. Micro-controllers run a version of μCOS with a modified thread schedule for better real-time performance.

Other Activities

KGNU Community Radio
2004–present
A local, non-profit, community radio station which provides news and music to the Boulder County region, Colorado, USA. Responsibilities included the writing and editing of news stories, assisting with the maintainance of various computer systems, and on-air announcements. I am now filing occasional stories on U.S.-European relations.