

Andrew Cencini
Bennington College
Science, Mathematics and Computing
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Current Position

Computing Faculty; Science, Mathematics and Computing, *Bennington College*
July 2012 – present

Graduate Advisor; Master of Arts in Liberal Studies Program, *Skidmore College*
December 2014 – present
Graduate Student: Justin Vasselli

VP Engineering & Co-Founder; *Vapor IO*
March 2015 - present

Previous Positions

Instructor; Master of Arts in Liberal Studies Program, *Skidmore College*
July 2014

Lecturer; Department of Mathematics and Computer Science, *Skidmore College*
January 2011 – August 2011

Education

M.S., Computer Science – University of Washington, Seattle, WA; June, 2008.
Interests: Distributed Systems, Operating Systems, Database Management Systems,
Information and Communication Technology for the Developing World (ICTD).

B.A., Computer Science – Skidmore College, Saratoga Springs, NY; Magna Cum Laude,
2001
Senior Thesis: *File System Design and Implementation* (Departmental Honors)
Minor: Classics (Latin)

Courses Taught

Bennington College

On leave until Fall 2017.

Spring 2015

CS4153.01 – Object-Oriented Programming
DA4204.01 – Future Studio: Production to Launch *with Robert Ransick*
CS4199.01 – Tutorial (Torrent Glenn)

Fall 2014

CS2137.01 – Intensive Introduction to Computer Science

CS4170.01 – Programming and Data Structures in C
DA4204.01 – Future Studio: Idea to Prototype *with Robert Ransick*
CS4199.01 – Tutorial (Robin Hrynyszyn)

Spring 2014

CS2137.01 – Intensive Introduction to Computer Science
CS4152.01 – Operating Systems
CS4160.01 – Systemic and Generative Visual Investigations *with Guy Snover*
PHY4203.01 – How to Build a Radio Telescope *with Hugh Crowl*
CS4695.01 – Tutorial (Klemente Gilbert-Espada)

Fall 2013

CS2108.01 – Computing in the Developing World
CS4125.01 – Distributed Systems
CS4125.01L – Distributed Systems Lab
CS4199.01 – Tutorial (Caseysimone Cooper)

Spring 2013

CS2107.01 – Make Me Dangerous
CS2107.01L – Make Me Dangerous Lab
CS4170.01 – Data Structures and Programming in C
CS4696.01 – Group Tutorial (Pratham Joshi, Jonathan Kiritharan)

Fall 2012

CS2150.01 – Computing Ecology
CS4130.01 – Big Data

Skidmore College

Summer 2014

MALS-SEM.001.SUM14 – MALS Introductory Seminar *with Rik Scarce, John Brueggemann, Rick Chrisman and Pat Oles*

Summer 2011

CS106 – Introduction to Computer Science I

Spring 2011

CS376 – Distributed Systems & Cloud Computing
CS106 – Introduction to Computer Science I
CS372 – Independent Study (Joe Yanks, Andrew Lichtenberg)

Teaching Tools

Smart Campus System – Development of a Raspberry Pi-based power monitoring system. To be used in classes at all levels to teach hardware, software, systems and data management. Funding from CAPA/Davis Grant for prototype and production hardware. (Summer 2014-present).

RamuntOS – A simple operating system for the Raspberry Pi, developed during “Operating Systems” course at Bennington College, Spring 2014. Students implemented basic memory management, boot, process switching and management and a simple serial console (UART) shell for the Raspberry Pi. Developed using ARMv6 assembler and C, with some consultation with existing bare-metal Raspberry Pi OSes in the wild. (2014)

GFS over Raspberry PI – Developed for “Distributed Systems” course at Bennington College, Fall 2013. Students implemented a variant of Google File System that ran over a collection of geographically distributed Raspberry Pi units with SATA hard drives attached. Learning objectives are various in the distributed systems area (fault expectancy, transactions, network programming, etc.). Students also analyzed performance and throughput of system for poster session. (2013)

Unix Scavenger Hunt – Developed as a way of providing students self-paced, discovery and experience based-competence using the Unix command shell. Clues are hidden throughout the lab machines, networked storage, and the open Internet, and students progress at their own pace to solve problems while learning basic Unix commands. Used in Intensive Introduction to Computer Science and Make Me Dangerous classes at Bennington College, and under continuous development. (2012-2014)

Bride of Tweet-a-Watt – Used Fall 2012 in “Computing Ecology” at Bennington College as a combination hardware making exercise and introduction to Python. Students built approximately 14 variants of the popular Tweet-a-Watt project to wirelessly monitor and graph power consumption. Learning objectives were hardware / e-waste awareness and familiarity, gentle introduction to Python, computational thinking and basic operating systems skills. (2012)

Skearch – “Skidmore Search” – Used to teach distributed systems – a fully-functioning Web Search engine written in Java. Certain pieces are removed, and students are responsible for implementing functionality as well as coordinating communication between various processes in the system. Built and deployed on Amazon Web Services with a \$2700 AWS Teaching Grant. (2011)

ChordTopoMaps – Visualization tool to demonstrate distributed hash table routing and efficiency for comparing different approaches to DHT organization and structure. Used whenever teaching peer-to-peer and distributed hash table topics. <http://www.cencini.com/ChordTopoMaps/>. (2008).

SearchDigger – Award-winning tool developed while in MSN Search to provide distributed system performance visualization and analysis. Extracted and presented latency information for queries as they passed through the distributed system. Proved to be extremely useful in troubleshooting throughput and latency problems in early stages of search engine development. Collaborated with MSR Magpie team who were working on a similar project aimed at distributed web transactions. Used when teaching distributed systems and latency measurements topics (2005).

Grants / Funding

Bennington College Faculty Travel Grant. \$1200. Travel to SIGCSE in Kansas City. (March 2015).

Amazon Web Services. \$2900. AWS in Education credits to support teaching “Intensive Introduction to Computer Science” and “Future Studio”. (Fall 2014)

DARPA, \$950,000 (not awarded). DARPA-BAA-14-21: Mission-Tailored OpenStack Tools for Robust Human-trafficking Analysis (MOTHRA). With Martin Voshell (Charles River Analytics). (Spring 2014)

Bennington College Faculty Travel Grant. \$1200. Travel to OpenCompute Summit to present and mentor at the Hardware Hackathon at the summit in Santa Clara, CA. (January 2014)

DARPA, unspecified amount. DARPA-SN-14-08: Functional Architecture of the Brain, Restoring Impairments and Improving Cognition (FABRIC) Request for Information (RFI). Large-Scale Open Organization of Mind Research (LOOM). With Martin Voshell (Charles River Analytics) and Flip Phillips (Skidmore College). (November 2013 – under review)

Amazon Web Services. \$2100. AWS in Education credits to support teaching “Distributed Systems”. (Fall 2013)

Bennington College Faculty Travel Grant. \$1200. Travel to OSCON2013 to present on open-source OpenCompute hardware hacking work. (Summer 2013)

Davis Educational Foundation / CAPA Grant. \$10,000. “*Demonstration Urban/Rural Wireless Mesh Network*”. Primary Investigator. (April 2013)

Gates Foundation / College Knowledge Challenge. *Finalist*. With Deborah Warnock and Robert Ransick. \$100,000. “*YES!College and RateMyAid*”. Primary Investigator. (December 2012)

Amazon Web Services. \$2000. AWS in Education credits to support teaching “Big Data”. (Fall 2012)

Bennington College Faculty Travel Grant. \$1200. Travel to Menlo Park, CA to develop and present “Big Cheese”, award-winning open-source hardware project. (Spring 2013)

Bennington College Faculty Travel Grant. \$1200. Travel to Santa Clara, CA to develop and present “Cheesy Fingers”, award-winning open-source hardware project. (Fall 2012)

Amazon Web Services. \$2400. AWS in Education credits to support teaching “Cloud Computing and Distributed Systems”. (Spring 2010)

Patents

Cencini, A., White, S., Crawford, C. – U.S. Provisional Patent Application (62/275,909), December 2015. *Rack for Computing Equipment*.

Gambardella, M., Cencini, A., Broderick-Phillips, B., Joshi, P. – U.S. Patent Application, February 2013. *Devices, Systems, and Methods for Distributed Monitoring and Control of Networked Server Computers*.

White, S., Ehlen, J., Cencini, A., Kaplin, D. – U.S. Provisional Patent Application, January 2013. *System and Method for Wireless Monitoring of Data Center Equipment*. (In preparation).

Cencini, A., Khanolkar, N., Lu, J., Popescu-Stanesti, M. - U.S. Patent 7,509,252, Granted March 24, 2009. *Full-text index module consistency checking*.

Cencini, Andrew B. - U.S. Patent Application 2006/0277189 (11/143,000), Published December 7, 2006. *Translation of search result display elements*.

Cencini, Andrew B. - U.S. Patent Application 2006/0161541 (11/037,130), Published July 20, 2006. *System and method for prefetching and caching query results*.

Research, Software, Hardware and Artistic Projects

Vapor IO. Serve as VP Engineering and Co-Founder of data center infrastructure startup – responsible for creation of key software intellectual property related to data centers and distributed systems. Lead development of Vapor Chamber, OpenDCRE, Vapor CORE and Vapor Crate, among other projects. Build development team, assist in overall management of company. Company was funded by Goldman Sachs and Austin Ventures, and has received extensive press. (March 2015-present)

Chestnut (Prototype), Bennington College. Worked with students, faculty and external collaborator (Steve White) to develop and implement a Bluetooth Low-Energy beacon prototype and app prototype as part of *Future Studio* (with Robert Ransick). Chestnut prototype shown in *3D Digital: Here and Now* at Bennington Museum (March 26 – June 15, 2016).

Smart Campus System, Bennington College. Developed power monitoring and reporting system using Raspberry Pi and common off-the-shelf components. To be released as an open-source hardware project, used as a teaching tool, and tentatively deployed on campus. (Summer 2014-Spring 2015)

Student Exhibition, President’s Gallery, Bennington College – “Code Complete” – Code-generated drawings by students in Systemic and Generative Visual Investigations. Marker on paper, via Rhino/Python and ShopBot CNC with custom pen attachment. With Guy Snover and SGVI students. (Spring 2014)

Sculpture Installation, Bennington College – “rs.done” – Code-generated sculpture, 2”x4”x8’ #2 pine lumber and 3” decking screws. Designed via Rhino/Python, cut, numbered and assembled in 48 hours by Systemic and Generative Visual Investigations students. With Guy Snover and SGVI students. (Spring 2014)

Small Radio Telescope, Dickinson Science Center, Bennington College. Built small radio telescope with Hugh Crowl and students in “How to Build a Radio Telescope” class, installed on science building roof. Improved software and documentation. With Hugh Crowl and students. (Spring 2014)

White, S., Cencini, A., Kaplin, D., Gambardella, M. *Big Cheese* – Winning submission to OpenCompute Project’s second “hardware hackathon” in June 2013. Designed and wrote software, 802.15.4-based low-power wireless “EZ Cheese” communication protocol to communicate with and aggregate data from “Cheesy Fingers” devices. Written in C, and runs on a Raspberry Pi using its general-purpose I/O (GPIO) pins to communicate with custom-built board including RF and serial/bluetooth communications. Several components to be incorporated into teaching tool for demonstration wireless mesh network activity in “Computing in the Developing World” (June 2013-present)

White, S., Ehlen, J., Cencini, A., Kaplin, D., *Cheesy Fingers* – Winning submission to OpenCompute Project’s “hardware hackathon” in January 2013. Designed and wrote PIC24 firmware to manage 802.15.4 RF communications hardware and protocol, and to interact with motherboard debug header and external sensors. (January 2013-present)

Cencini, A., “*Untitled*” - Python simulation of MIT’s Chord distributed hash table implementation, with point-to-point hop-count calculations, mapped into Rhino-3D, and laser-cut onto 0.25” birch plywood, arranged into approx. 17” x 17” square. (December 2012-present)

Cencini, A., *IPMI Library for PIC24/32 Microcontrollers* – C-based microcontroller implementation of standards-based IPMI server management protocol. (July 2012)

Cencini, A., *NChord - C# implementation of Chord distributed hash table*.
<http://nchord.sourceforge.net>. (2008)

Cencini, A., *Resonance: DHT-based Structured Object Storage and Retrieval for Large-Scale Data Center Management*, Unpublished Manuscript. (November 2008)

Phillips, F., Shomphe J., Cencini, A., *The eel Experiment Language*, Unpublished Manuscript. (May 2000)

Honors & Awards

“The 10 Coolest Cloud Startups of 2015 (So Far)” – CRN, 7/2015.

Winner, OpenCompute Hardware Hackathon II. *Big Cheese*. Wireless server monitoring data aggregation hardware and software plus iPad app. \$10,000 prize awarded for this work. June 19, 2013; Menlo Park, CA.

Winner, OpenCompute Hardware Hackathon. *Cheesy Fingers*. Wireless server monitoring hardware and software design. Received provisional patent application funding and assistance for this work. January 17, 2013; Santa Clara, CA.

Presentations/Invited Talks & Contributions

“*OpenDCRE: Next-Generation Data Center Management*” – OpenCompute Summit 2016 – March 2016, Santa Clara, CA. With S. White.

“*OpenDCRE: Modern Data Center Management*” – Goldman Sachs – February 2016, New York, NY.

“*IPMI Detox: How OpenDCRE Can Help Kick a Bad Habit*” – Data Center Dynamics – October 2015, Chicago, IL.

“*Introduction to OpenDCRE*” – Boston High Performance and Supercomputing Group – October 2015, Boston, MA.

“*The Anti-converged System: 10 Steps to a Disaggregated Data Center*”, eWeek – November 2015. With Cole Crawford.

“*Introduction to OpenCompute Hardware Hacking*” – OpenCompute Summit 2014 – January 2014, Santa Clara, CA. With S. White.

“*Software is Dead! Long Live Software!*” – Faculty Supper Club – October 15, 2013, Bennington College.

“*Project Cheesy Fingers: Open-Source Hardware Hacking*” – OSCON2013 – July 2013, Portland, OR. With S. White.

“*Civil Society for Sale: Virtual Civil Society*” – Invited talk & panel – February 2013, Skidmore College, Saratoga Springs, NY.

“*Cloud Control: Open-Source IPMI Library*” – Science Workshop – September 2012, Bennington College.

Cencini, A., *SQL Server 2005 Full-Text Search: Internals and Enhancements*, MSDN, December 2003.

Cencini, A., *Testing a Full-Text Search Stemmer in C#*, Invited contribution, SQLJunkies, December 2003

Cencini, A., *Testing a Full-Text Search IFilter in C#*, Invited contribution, SQLJunkies, December 2003

Cencini, A., *Testing a Full-Text Search Wordbreaker Using C#*, Invited contribution, SQLJunkies, December 2003

Cencini, A., *Building Search Applications for the Web Using Microsoft SQL Server 2000 Full-Text Search*, MSDN, December 2002.

College Initiatives / Service

College Steering Committee – Spring 2015.

Sustainability Working Group – Spring 2015-present.

Bennington Word and Image Lab - Participant – Spring 2015.

Cognitive Neuroscience Faculty Search Committee – Spring 2015.

Inauguration Committee – Fall 2013-Spring 2014.

Science Workshop Organizer – Fall 2013-Spring 2014.

Environmental Studies Program Group – Fall 2012-present.

CAPA Program Group – Spring 2013-present.

CAPA Conflict Resolution and Systems Design Program Group – Spring 2013-present.

Judicial Committee, Bennington College. Fall 2013 – Spring 2015.

Sustainability Committee, Bennington College. 2012 – present.

Faculty Rhino 3D Modeling Class - Participant – Fall 2012.

Bennington Science Blog – Administrator, Contributor – Fall 2012-present.
<http://science.bennington.edu>

Bennington CATLovers (Computers and Technology) student group, Faculty Advisor – Spring 2013-present.

Thread – invited storyteller – “*Five Weeks of Labor Day*” – Fall 2012.

Professional Activities, Outreach, Service & Membership

Advisor, Renasar, Inc. – Acquired by EMC (Fall 2014-present).

Book Reviewer, “Data Abstraction and Problem Solving with C++: Walls and Mirrors” (6th Ed). (2014)

Book Reviewer, “Introduction to Computing and Programming in Python” (3rd Ed). (2014)

External Reviewer, Marlboro College, senior work of Isaac DuPree. (2013)

Mentor, Arlington Middle School Robotics Team (2013-present)

Captain, North Bennington Fire Department (2012 – present)

Engineer, Round Lake Fire Department (2011-2012)

Director, Technology 4 Public Good (t4pg) (2011 – present)

Paper Reviewer, VLDB 2006. (2006)

Contributor, XQuery 1.0 and XPath 2.0 Full-Text (W3C Working Draft). (2004)

Book Reviewer: “Microsoft SQL Server 2000 High Availability” (Hirt, Cook, McBath and Tripp). (2003)

Member, Association for Computing Machinery. (1999 – present)

Member, ACM SIGCSE. (2013-present)

Member, USENIX. (1998-2001, 2014-present)

Reviews / Media

For media related to Vapor IO:

<http://www.vapor.io/news/recent-news-coverage/>

Stacey Higginbotham, “*Open Compute is Bringing the Maker Movement to the Enterprise*” – GigaOm, June 19, 2013. <http://gigaom.com/2013/06/19/open-compute-is-bringing-the-maker-movement-to-the-enterprise/>.

Zeke Wright, “*AMMS Students Place Second in Regional Robotics Tournament*” – Bennington Banner – May 13, 2013. http://www.benningtonbanner.com/ci_23229091/amms-students-place-second-regional-robotics-tournament.

Jordan Novet, “*Open Compute Project Names Hackathon Winner*” – GigaOm, January 24, 2013. <http://gigaom.com/2013/01/24/open-compute-project-names-hackathon-winner/>.

Taylor Hatmaker, “*Facebook’s Open Compute Hardware Hackathon Yields Server Debugging Solution*” – ReadWrite – January 21, 2013. <http://readwrite.com/2013/01/21/facebooks-open-compute-hardware-hackathon-yields-server-debugging-solution>.

Professional Experience

Vapor IO, VP Engineering & Co-Founder

March 2015 – present

Co-founded and currently serve as VP Engineering responsible for software products built by Vapor IO. Manage a 4-person development team, collaborate with hardware engineering, marketing, etc. to develop hardware and software products for data center service optimization. Funded by Goldman Sachs and Austin Ventures.

Nebula, Hardware & Software Design Consultant

May 2011 – June 2013

Designed and implemented firmware and hardware for private cloud infrastructure. Recruited and supervised two student interns to work for 7 weeks over Bennington College’s Field Work Term (January-February 2013). Part of award-winning OpenCompute hardware hackathon team awarded provisional patent application for design of “Cheesy Fingers” wireless server debugging component and aggregator. Named as inventor on patent related to hardware design core to Nebula’s business.

ZT Systems, Senior Software Engineer / Software Architect

October 2008 – July 2010

Designed, developed and tested factory and data center automation infrastructure, including custom extensions to Microsoft’s DHCP server, factory workflow system, and the only known .NET implementation of the IPMI 2.0 out-of-band management standard in shared library and PowerShell cmdlet form. Worked with hardware team on prototypes of low-power / low-overhead server hardware for internet-scale data centers and industrial and academic research projects for clients such as Microsoft Research. Languages & Technologies: IPMI, C#, C++/STL/COM, PowerShell, SQL, MS-DHCP

Verdiem Corporation, Senior Software Engineer

February 2008 – September 2008

Developed and maintained power-management software products for enterprise, software-as-a-service, and consumer environments. Wrote design documents and specifications, implemented new functionality, maintained and updated existing functionality, implemented and maintained unit tests.

Languages & Technologies: C++/STL/ATL/COM, C#, Web Services, SQL, gSOAP.

Rackable Systems (SGI), Architect

October 2006 – February 2008

Licensed .NET distributed hash table implementation to Rackable and provided full-time contract software development to integrate and broaden the application. Developed “Resonance,” a structured object data store built on top of the Chord distributed hash table – intended for use in large-scale data center systems management. Produced an unpublished research paper describing the architecture and evaluating its performance.

Served as project architect to ensure correct technical direction and priorities.

Responsibilities: Core DHT implementation and support, bug fixing, unit / performance testing, research and development related to large-scale deployment and monitoring.

Languages: C#/Mono

Microsoft Corporation, Program Manager

July 2001 – July 2006

Delivered software and services used by millions of people every day: SQL Server 2005, MSN Search 1.0 (now Bing), SQL Server 2000 (64-bit edition), Exchange Hosted Services.

Responsibilities: Core index serving & performance (MSN Search); Full-Text Search (SQL Server); Systems automation and management (Exchange Hosted Services).

Consistent high achiever, managed complex software development processes, recipient of two Microsoft Gold Star awards, filed several patent applications and published several professional articles in the areas of database management systems and web search, standards work contributing to W3C XQuery Full-Text Search working draft, worked as key part of team to design, build and deliver MSN Search 1.0 – a massive distributed system comprised of tens of thousands of servers in multiple data centers.

Languages: C#, C++, AMD/x86 Assembler, Transact-SQL, XQuery

Justa Technology Co., Software Developer

June 1999-September 2000

Designed and built components of data caching technology, web tracking system.

Languages: C++, VBScript/ASP

Skidmore College, UNIX Systems Administrator

September 1999 – July 2001

Maintained college-wide UNIX servers, performed security analysis and forensics, developed numerous tools and scripts to integrate and manage heterogeneous systems.

Technologies: SunOS, Solaris (up to 8), AS/400, Oracle, Java, OpenVMS, Red Hat Linux, Perl, shell scripting, UNIX security

Hobbies and Interests

Hiking, cycling, travel, cooking, gardening, board games, crossword puzzles, Mesoamerican archeology, public transportation, firefighting.