

# BRIAN ROBERT CALLAHAN

Curriculum vitae

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<https://briancallahan.net/>

## EDUCATION

- Ph.D.** Science & Technology Studies, Rensselaer Polytechnic Institute, Troy, NY  
August 2018  
Dissertation: *Complexities of Collaboration: An Open Source Story*  
Dissertation Advisor: Mike Fortun
- MS** Science & Technology Studies, Rensselaer Polytechnic Institute, Troy, NY  
December 2015
- MA** Anthropology, Monmouth University, West Long Branch, NJ  
August 2014  
Thesis: *From Basson to Fagott: Evolution vs. Revolution*  
Thesis Advisor: William P. Mitchell
- BHA** Music Performance & Anthropology, Carnegie Mellon University, Pittsburgh, PA  
May 2009  
*College Honors*  
*University Honors*

## REFEREED PUBLICATIONS

### Journal Articles

Fortun, Kim, **Brian Callahan**, Brandon Costelloe-Kuehn, Brad Fidler, Alison Kenner, Aalok Khandekar, Alli Morgan, Lindsay Poirier, and Mike Fortun. Forthcoming. "Hosting the Platform for Experimental, Collaborative Ethnography." *American Anthropology*.

**Callahan, Brian Robert**, Charles Hathaway, and Mukkai Krishnamoorthy. 2016. "Quantitative Metrics for Generative Justice: Graphing the Value of Diversity." *Teknokultura* 13(2): 567-586.

### Book Chapters

Fortun, Mike, Lindsay Poirier, Alli Morgan, **Brian Callahan**, and Kim Fortun. 2021. "What's so funny 'bout PECE, TAF, and Data Sharing?" In *Collaborative Anthropology Today: A Collection of Exceptions*, edited by Dominic Boyer and George E. Marcus, Pp. 115-140. Cornell University Press.

Eglash, Ron, William Babbitt, Audrey Bennett, Kathryn Bennett, **Brian Callahan**, James Davis, John Drazen, et al. 2016. "Culturally Situated Design Tools: Generative Justice as a Foundation for STEM Diversity." In *Moving Students of Color from Consumers to Producers of Technology*, edited by Yolanda Rankin and Jakita Thomas, Pp. 132-151. Hershey, PA: IGI Global.

## Conference Proceedings

Zhang, Zheming and **Brian Robert Callahan**. 2022. "Preliminary analysis of an AI-powered transcription bot for FM transmissions." Proceedings of the 41st Annual ARRL and TAPR Digital Communications Conference (DCC): 116-125.

**Callahan, Brian Robert**. 2016. "SocialBSD: A Review of Diversity and Inclusivity Initiatives in the \*BSD Community and Imagining Future Pathways." Proceedings of AsiaBSDCon 2016: 167-176.

## AMATEUR RADIO PUBLICATIONS

**Callahan, Brian Robert** and Zheming Zhang. 2023. "An AI-powered transcription bot for FM transmissions." QEX 336 (January/February 2023): 25-30.

**Callahan, Brian Robert**. 2022. "A first commentary on the CW Record Protocol." QEX 334 (September/October 2022): 19-22.

**Callahan, Brian Robert**. 2022. "Experiments in gaming over SSTV." QEX 333 (July/August 2022): 25-29.

**Callahan, Brian Robert**. 2022. "DataTV: A protocol for embedding data into SSTV transmissions." QEX 331 (March/April 2022): 25-28.

**Callahan, Brian Robert**. 2021. "Protocol for Formatting and Transmitting Binary Data over Morse CW." QEX 326 (May/June 2021): 31-33.

## GRANTS/AWARDS WON

**2022** Earth Science Information Partners (ESIP) 2022 FUNding Friday Award: *Next Generation Tools for Democratizing Data Exploration with NASA Data Pathfinder*  
Earth Science Information Partners, Brian Callahan (RPI), PI  
Elizabeth R. Joyner (NASA), Thilanka Munasinghe (RPI), Kathy Fontaine (RPI), Ross Bagwell (NASA), co-PIs

**2020** Teaching and Learning Collaboratory Seed Grant: *The Rensselaer Cybersecurity Collaboratory*  
Rensselaer Polytechnic Institute, Brian Callahan, PI

## RESEARCH EXPERIENCE

**2022-present** Director, Rensselaer Cybersecurity Collaboratory (RensCC)  
Rensselaer Polytechnic Institute, Brian Callahan, PI

**2022-present** Co-Director, Rensselaer Blockchain Center of Excellence (BCCoE)  
Rensselaer Polytechnic Institute, Rick Plotka, PI

**2020-present** CISO, Platform for Experimental and Collaborative Ethnography (PECE)  
University of California, Irvine, Kim Fortun, PI

**2015-present** Lead Open Knowledge Developer, Platform for Experimental and

Collaborative Ethnography (PECE)  
University of California, Irvine, Kim Fortun, PI

**2015-present** Lead Systems Administrator, Platform for Experimental and Collaborative Ethnography (PECE)  
University of California, Irvine, Kim Fortun, PI

**2020-2022** Director, Cybersystems Security Research Group  
Rensselaer Polytechnic Institute, Brian Callahan, PI

**2014-2016** Fellow, GK-12/3Helix  
Rensselaer Polytechnic Institute, Ron Eglash, PI

## SCHOLARLY OUTPUTS

**2022-present** Rensselaer Cybersecurity Collaboratory (RensCC)  
The RensCC is a research laboratory focusing on cybersecurity research for graduate and undergraduate students, and undergraduate cybersecurity pedagogy development. Its ultimate goals are to bolster RPI's cybersecurity research portfolio and to attain the National Centers for Academic Excellence in Cybersecurity (NCAE-C) designation in Cyber Defense (CAE-CD). RensCC puts cybersecurity and educational leadership in the hands of students.

### *RensCC-sponsored research projects*

**2023** Next-generation cybersecurity pedagogy  
Advisee: Shuoyan Zhou  
Advisee: Rebecca Lin

**2023** Security enhancements to production C/C++ compilers to defeat ROPchains  
Advisee: Nicole Semenyuk  
Advisee: Jordan Oberstein  
Advisee: Ray Shi

**2022** Novel AI/ML systems to improve IDS/IPS anomaly detection accuracy  
Advisee: Sean Hale

### *RensCC-sponsored educational activities*

**2023** Developed information security awareness training for RPI students, staff, and faculty.

**2022** Enrolled 14 students into the National Cyber League Fall 2022 season.  
*Teams placed in the 99th and 94th percentiles.*  
*Individuals placed in the 97th and 91st percentiles.*

**2022-present** Microsoft Azure Cloud Computing Initiative  
This initiative, led by the Information Technology & Web Science program, provides free Microsoft Azure Cloud resources to all ITWS students for use in courses and personal/professional use.

*Contributions:* Faculty Co-Director

Worked with RPI DotCIO (IT services) to establish hardware and software cloud resource baselines, test cloud resource deployments, perform security evaluations, and oversee the execution of the initiative.

*Contributions:* Systems administrator

Maintain the integrity and security of deployed cloud resources.

*Contributions:* Cloud computing educator

Teach students DevOps and Cloud computing best practices.

*Contributions:* Pedagogy improvements

Use cloud resources as a core component in revamping existing ITWS courses.

**2021-present** Rensselaer Blockchain Center of Excellence (BCCoE)

The BCCoE is a public-private partnership that develops best practices for blockchain applications, including security, sustainability, inclusivity, documentation, and system administration, and applies state-of-the-art techniques to business applications of blockchain technologies.

*BCCoE-sponsored research projects*

**2022-2023** THORChain Arbitrage bot

Advisee: Philip Chang

**2022** Blockchain security and sustainability for data provenance

Advisee: Nicole Semenyuk

**2022** THORChain node operator documentation for AWS deployment

Advisee: Carlos Power

*Other contributions:* Systems administrator

Manage Cloud (AWS) deployments of THORChain software, recommend security best practices.

**2015-present** PECE, the Platform for Experimental Collaborative Ethnography

<https://zenodo.org/record/6829696>

PECE has a global network of over 500 users working on a wide variety of projects from Asthma and pollution research, to Disaster Studies, to Cybersecurity, Japanese oral history, and more. Also used to support numerous graduate and undergraduate courses at UCI, RPI, and beyond.

*Contributions:* Lead Open Knowledge Developer

Technical knowledge: code (HTML/CSS/JS/PHP), documentation, best practices for technological stewardship

*Contributions:* Lead Systems Administrator

Systems administration lead for the entire global network of servers, cybersecurity/information security, installation lead, maintenance lead; install and maintain a fleet of Cloud (AWS) servers with PECE installed.

*Contributions:* CISO

Information security/cybersecurity lead for the entire global network of servers, incident response, security policy and implementation, security

awareness/training, security communication

*Current Instances maintained, selected list:*

worldpece.org

theastmafiles.org

disaster-sts-network.org

centerforethnography.org

forschungswerk-stadt.de

cva.unifr.ch

*Historical Instances maintained, selected list:*

Japanese oral history project (decom. 2020)

## **FELLOWSHIPS AWARDED**

**2014-2016** GK-12/3Helix Fellowship, NSF

Rensselaer Polytechnic Institute, Ron Eglash, PI

## **CONFERENCE PARTICIPATION**

### **Workshops organized**

**2022** “Big Data Analytics for Humanitarian Crises” (with Thilanka Munasinghe, Jim Hendler, Rick Plotka, Kathy Fontaine, and Oshani Seneviratne), 2022 IEEE International Conference on Big Data, Osaka, Japan, Dec. 17-20.

### **Papers presented**

**2023** “How to build an AI-powered transcription bot for FM transmissions” (with Hisen Zhang), QSO Today Virtual Ham Expo, Mar. 24-26, 2023.

**2022** “Hands-on workshop: writing an assembler for the Intel 8080 in D,” DConf Online 2022, Dec. 17-18, 2022.

**2022** “Programs that create other programs: A beginner’s guide using D,” DConf Online 2022, Dec. 17-18, 2022.

**2022** “Potentially illegal Amateur Radio transmissions,” 2022 Summer School Virtual Conference, Jul. 25 - Aug. 6, 2022.

**2022** “Data Dexterity to Tackle Humanitarian Crises: Enabling students with data literacy (data dexterity) on how to effectively use Earth Observational data and other data sources to find reliable and effective solutions for humanitarian crises,” July 2022 Earth Science Information Partners (ESIP) Meeting: Data for All People: From Generation to Use and Understanding, Pittsburgh, PA, Jul. 19-22, 2022. (Thilanka Munasinghe, **Brian Callahan**, Kathy Fontaine, Rick Plotka, William Allen, Eryn Buhat, Tiffany Filawo, James Liu, Zijin Liu, Brianna Lopez, Yasmin Lu, Stone McLaren, Ronna Min, Jialin Yu, Nay Zaw Aung Win, Abraham Sandars)

**2022** “PolyglotBSD,” BSDCan 2022, Jun. 3-4, 2022.

**2021** “Life Outside the Big 4: The Adventure of D on OpenBSD,” DConf 2021, Nov. 20-21, 2021.

- 2021 "Stories from reviving and extending a university's information security program," Seattle GNU/Linux Conference 2021, Nov. 5-6, 2021.
- 2021 "Design your own communication protocols," QSO Today Virtual Ham Expo, Aug. 14-15, 2021.
- 2021 "Talking PECE: Translating social science speak to technologists and vice-versa," 2021 Summer School Virtual Conference, Jul 26 - Aug. 6, 2021.
- 2021 "The education of hacking: A year of teaching all the things," BSidesROC 2021, Rochester, NY. Mar. 20, 2021.
- 2020 "Middleware, Light Structure, Experimental Systems: Designing the Platform for Experimental Collaborative Ethnography (PECE)," 4S/EASTS Conference. August 2020. (Mike Fortun, Kim Fortun, Tim Schutz, Angela Okune, James Adams, Prerna Srigyan, Lindsay Poirier, **Brian Callahan**, Brandon Costelloe-Kuehn, Ali Kenner, Aalok Khandekar, Renato Vasconcellos Gomes)
- 2020 "The education of hacking: A year of teaching all the things," BSidesROC 2020, Rochester, NY. Mar. 21, 2020. (Canceled/COVID-19)
- 2019 "Learning to (Open)BSD through its porting system," vBSDCon 2019, Reston, VA, Sep. 5-7, 2019.
- 2018 "Hosting the Platform for Experimental Collaborative Ethnography," Displacements: the Biennial Meeting of the Society for Cultural Anthropology, Apr. 19, 2018. (Kim Fortun, Mike Fortun, Lindsay Poirier, Alli Morgan, **Brian Callahan**, Brandon Costelloe-Kuehn, Alison Kennner, Brad Fidler, Aalok Khandekar)
- 2018 "Making it all work: The Infrastructures and Limits of (Digital) Collaboration," Institutions and Societies 2018, SUNY Albany, Albany, NY, Feb 23, 2018.
- 2017 "Coding Collaboration: Exploring a Definition Through a Transgender Hacker Collective," American Anthropological Association Annual Meeting 2017, Washington, D.C., Nov. 29-Dec. 3, 2017.
- 2017 "Leveraging Collaborative Mentorship to Strengthen Your Free Software Community" (with Lisa Marie Maginnis), Seattle GNU/Linux Conference, Seattle Central University, Seattle, WA, Oct. 6-7, 2017.
- 2017 "Rethinking Citizen Science by Doing Citizen Science" (with J. Dylan Rees), Society for the Social Studies of Science Conference 2017, Boston, MA, Aug. 30-Sep. 2, 2017.
- 2017 "Collaboration as a multi-scalar phenomenon," Northeast Science and Technology Studies Conference 2017, York University, Toronto, Ontario, Canada, Apr. 22-23, 2017.

- 2016 “Trans Tech: Ethnography of a Hacker Collective,” American Anthropological Association Annual Meeting 2016, Minneapolis, MN, Nov. 16-20, 2016.
- 2016 “Towards a Transgender Technoscience,” Trans\*Studies Conference 2016, University of Arizona, Tucson, AZ, Sep. 7-10, 2016.
- 2016 “Diverse Be-longings: Trans Hacker Collectives as New Sites of Tech Diversity Understandings,” Theorizing the Web 2016, New York, NY, Apr. 15-16, 2016.
- 2016 “Trans Code: Free Software as Model & Critique of Diversity by Transgender Hackers” (with Lillian Lemmer), LibrePlanet 2016, MIT, Cambridge, MA, Mar. 19-20, 2016.
- 2016 “SocialBSD: A Review of Diversity and Inclusivity Initiatives in the \*BSD Community and Imagining Future Pathways,” AsiaBSDCon 2016, Tokyo University of Science, Tokyo, Japan, Mar. 10-13, 2016.
- 2016 “The Trans Tech Network: Using Culture to Challenge Structure and Diversity,” Institutions and Societies 2016, SUNY Albany, Albany, NY, Feb. 26, 2016.
- 2015 “Pathways to Social Justice in Social Science-Computer Science Collaboration,” American Anthropological Association Annual Meeting 2015, Denver, CO, Nov. 18-22, 2015.
- 2015 “Devio.us, the Free OpenBSD Shell Provider and Online \*BSD User Group: Technical and Social Lessons Learned from Half a Decade of Service” (with Bryce Chidester), vBSDcon 2015, Reston, VA, Sep. 11-13, 2015.
- 2015 “Building BUGs: A Broad View of the New York City \*BSD User Group” (with George Rosamond), BSDCan 2015, University of Ottawa, Ottawa, Canada, Jun. 10-13, 2015.

#### **Posters presented**

- 2022 “Enabling Data Dexterity Among Students Using a NASA Data Pathfinder” (Kathy Fontaine, Thilanka Munasinghe, **Brian Callahan**, Rick Plotka, Ross Bagwell, Elizabeth Joyner), American Geophysical Union Fall Meeting 2022, Chicago, IL, Dec. 12-13, 2022.

#### **Conferences organized**

- 2014 New York City \*BSD Conference 2014, New York, New York, Feb. 8, 2014.

#### **INVITED TALKS**

- 2021 CU Boulder Technology, Cybersecurity & Policy Seminar Series, CU Boulder, Oct. 25, 2021.
- 2021 “PolyglotBSD,” New York City \*BSD User Group, May 5, 2021.

- 2020** "Introducing the CW Record Protocol," Troy Amateur Radio Association, Nov. 17, 2020.
- 2019** "Hypatia Software Organization: A who, what, why, and how of advancing diversity in technology," Defcon 201, Sep. 20, 2019.
- 2018** "OpenBSD and You," Defcon 201, Dec. 21, 2018.

## **INTERVIEWS**

- 2022** "Eclectic Tech," Episode 60, American Radio Relay League, May 19, 2022.
- 2021** "Open Source Voices," Episode 26, Dec. 14, 2021.
- 2021** "QSO Today," Episode 371, Oct. 16, 2021.
- 2021** "BSD Now," Episode 422, Sep. 30, 2021.
- 2021** "Eclectic Tech," Episode 38, American Radio Relay League, Jul. 15, 2021.

## **CAMPUS/DEPARTMENTAL TALKS**

### **Rensselaer Polytechnic Institute, Troy, NY**

*Department of Computer Science*

Introduction to Open Source: Lab, Open Source Documentation and Community Interaction (Spring 2017, Fall 2016, Spring 2016, Fall 2015)

**Spring 2015** Rensselaer Center for Open Source: Lecture, Welcome to OpenBSD!

*Department of Interdisciplinary Humanities and Social Sciences*

**Fall 2016** Open Source Art, Music, and Culture: Lecture, Transgender Communities in Open Source

## **TEACHING EXPERIENCE**

### **Courses Taught**

### **Rensselaer Polytechnic Institute, Troy, NY**

*IT & Web Science Program*

**Spring 2023** Information Systems Security  
Web Science Systems Development

**Winter 2022** (ISC)2 SSCP & CC Infosec Certification Crash Course

**Fall 2022** Modern Binary Exploitation  
Web Systems Development  
Deep Learning & Security (as independent study)

**Spring 2022** Information Systems Security  
Web Science Systems Development  
Technology Studies (as independent study)



**Winter 2021** CompTIA Security+ Certification Crash Course

**Fall 2021** SSCP Infosec Certification  
Web Systems Development

**Spring 2021** Information Systems Security  
Web Science Systems Development  
OSCP Certification (as independent study)  
SSCP Certification (as independent study)

**Fall 2020** Modern Binary Exploitation  
Web Systems Development  
SSCP Certification (as independent study)

**Spring 2020** Information Systems Security  
Web Systems Science Development

**Fall 2019** Modern Binary Exploitation (Instructor of Record; co-taught with Dr. Ana  
Milanova, Computer Science)  
Web Systems Development  
Web Science Systems Development (as large-group independent study)

**Spring 2019** Information Systems Security  
Web Science Systems Development  
Modern Binary Exploitation (as large-group independent study)  
Penetration Testing (independent study)

**Spring 2017** IT & Society

*Department of Science & Technology Studies*

**Spring 2018** Introduction to STS  
Sustainability by Design  
Sustainability Careers

**Fall 2017** Gender in Culture  
Gender in History  
Introduction to STS

**Spring 2017** Design in Culture  
Race as a Global Challenge  
Race in Culture  
Sustainability by Design

**Fall 2016** Gender in Culture  
Introduction to STS

**Russell Sage College, Troy, NY**

*Department of Arts & Letters*

**Fall 2018** Public Speaking & Presentations

**DEPARTMENTAL/UNIVERSITY SERVICE**

<b>2022-present</b>	Graduate Program Director, Information Technology & Web Science
<b>2021-present</b>	Faculty advisor, W2SZ, the amateur radio club at RPI
<b>2021-present</b>	Graduate Admissions Committee, Information Technology & Web Science, Chair
<b>2021-present</b>	Graduate Curriculum Committee, Information Technology & Web Science, Chair
<b>2019-present</b>	Undergraduate Curriculum Committee, Information Technology & Web Science, Member
<b>2019-present</b>	Concentration advisor, Information Dominance, Graduate, ITWS
<b>2019-present</b>	Concentration advisor, Information Security, Graduate, ITWS
<b>2019-present</b>	Concentration advisor, STS, Undergraduate, ITWS
<b>2019-present</b>	Concentration advisor, Information Security, Undergraduate, ITWS
<b>2019-present</b>	Faculty advisor, RPI-Sage chapter of Hillel International: The Foundation for Jewish Life at Colleges and Universities
<b>2019-present</b>	Faculty advisor, RPISEC, the Information Security Club and CTF Team at RPI
<b>2022</b>	Judge, HackRPI 2022
<b>2021-2022</b>	Graduate Administrator, Information Technology & Web Science
<b>2021</b>	Judge, HackRPI 2021
<b>2019-2020</b>	Graduate Admissions Committee, Information Technology & Web Science, Member
<b>2019-2020</b>	Graduate Curriculum Committee, Information Technology & Web Science, Member
<b>2019-2020</b>	Cybersecurity Analysis Team, Member Rensselaer Polytechnic Institute
<b>2016-2019</b>	Principal Bassoonist, University Orchestra

## Rensselaer Polytechnic Institute

- 2016-2017** Department of Science & Technology Studies Colloquium Committee  
Rensselaer Polytechnic Institute
- 2016-2017** Department of Science & Technology Studies Graduate Representative  
Rensselaer Polytechnic Institute
- 2012-2014** Information Technology University Steering Council, Graduate  
Representative  
Monmouth University
- 2012-2014** Principal Bassoonist, University Orchestra  
Monmouth University

## GRADUATE THESES ADVISED

- 2022-2023** THORChain Arbitrage bot  
Advisee: Philip Chang, Information Technology & Web Science
- 2021-2023** Advisee: Astra Ford, Computer Science
- 2022** THORChain node operator documentation for AWS deployment  
Advisee: Carlos Power, Information Technology & Web Science (co-advised with  
Rick Plotka, Information Technology & Web Science)
- 2022** Graph relationship interfaces for unstructured data management  
Advisee: Nick Meyer, Information Technology & Web Science
- 2021-2022** Malware investigations  
Advisee: Stephen Trepel, Computer Science (co-advised with Dr. Bulent Yener,  
Computer Science)
- 2021** A security-focused open source clone of the Amazon SQS messaging service  
Advisee: Honghao Li, Information Technology & Web Science
- 2021** A security policy combating counterfeiting for the average small business  
Advisee: Isaac Llewellyn, Information Technology & Web Science

## UNDERGRADUATE THESES ADVISED

- 2017** Pedestrian Dis/Order: Reimagining Our Urban Streets  
Advisee: Morgan Johnson, Science & Technology Studies

## PROFESSIONAL AFFILIATIONS

- American Anthropological Association
- American Association for the Advancement of Science
- American Radio Relay League
- Association for Computing Machinery

Computing Technology Industry Association (CompTIA)  
CompTIA Instructor Network  
Earth Science Information Partners  
(ISC)2: International Information Systems Security Certification Consortium  
Society for the History of Technology  
Society for the Social Studies of Science  
Tucson Amateur Packet Radio

## PROFESSIONAL CERTIFICATIONS

*CompTIA*  
A+ CE  
Cloud Essentials+  
Data+ CE  
ITF+  
Linux+ CE  
Network+ CE  
PenTest+ CE  
Project+  
Security+ CE

CIOS: CompTIA IT Operations Specialist (A+/Network+)  
CLNP: CompTIA Linux Network Professional (Network+/Linux+)  
CNVP: CompTIA Network Vulnerability Assessment Professional (Security+/PenTest+)  
CSIS: CompTIA Secure Infrastructure Specialist (A+/Network+/Security+)  
CSSS: CompTIA Systems Support Specialist (A+/Linux+)

*(ISC)2*  
CC: Certified in Cybersecurity  
SSCP: Systems Security Certified Practitioner

*Microsoft Certified*  
AI-900: Azure AI Fundamentals  
AZ-900: Azure Fundamentals  
DP-900: Azure Data Fundamentals  
PL-900: Power Platform Fundamentals  
SC-900: Security, Compliance, and Identity Fundamentals

*Scrum.org*  
PSM I: Professional Scrum Master I  
PSPO I: Professional Scrum Product Owner I

## NON-PROFIT/PROFESSIONAL EXPERIENCE/VOLUNTEERING

**2013-present**      Developer, The OpenBSD Project  
Calgary, Alberta, Canada

**2021-present**      Developer & OpenBSD maintainer, D Programming Language  
Kenmore, WA

<b>2020-2023</b>	Sole Owner & Sole Developer, FreeBee.fun Troy, NY
<b>2022</b>	Judge, Joseph Henry Science Fair (elementary and junior high school science fair) College of Saint Rose
<b>2016-2021</b>	Clerk, Hypatia Software Organization, Inc. Boston, MA
<b>2016-2021</b>	Director, Hypatia Software Organization, Inc. Boston, MA
<b>2015-2016</b>	Developer, LiteBSD
<b>2014-2016</b>	Developer, RetroBSD