

# PTR summary

Wu-chang Feng (10/2/2018)

Promoted to Professor in 2013

Since promotion to full professor, I have shifted over to activities that emphasize teaching and service. This has been motivated by a personal desire to begin to give back the kinds of experiences to students that I benefitted from when I was a student.

## Research:

I've put my resources into security education work. Since finding qualified Ph.D. students is so difficult, doing this kind of work allows me to get productive work done using masters students, advanced undergraduates, and (as long as they're Melanie Mitchell's sons) high-school students. My funding for these activities has been through multiple grants from NSF's SaTC EDU program and continuing grants from NSA's GenCyber program:

- Wu-chang Feng (PI), “SaTC: EDU: Curricula and CTF Exercises for Teaching Smart Fuzzing and Symbolic Execution”, NSF 1821841, \$279,448 (09/2018–09/2020).
- Wu-chang Feng (PI) (with Co-PI Charles Wright), “EDU: A Capture-the-Flag Service for Computer Security Courses”, NSF 1623400, \$299,795 (09/2016–09/2018).
- Wu-chang Feng (Co-PI with Bob Liebman of Sociology and Ellie Harmon), “GenCyber Narrative: Portland State University Combo Camp”, NSA GenCyber 206855 \$100,000, (07/2017).
- Wu-chang Feng (Co-PI with Bob Liebman and Lois Delcambre), “CyberPDX 2016: A Student-Teacher Combination Camp for Integrated Learning and High School Course Development ”, NSA GenCyber \$100,000, (07/2016).

As the grants indicate, my main activities have been to develop innovative exercises and experiences for teaching computer security. This involves creating Capture-the-Flag exercises for several of our courses (including a reverse-engineering CTF and a symbolic execution CTF) as well as running camps for high-school students (CyberPDX, which is now in its 6th year). Along the way, I've also attempted to mentor both Charles Wright and Ellie Harmon to help them establish their research activities. Charles served as a co-PI in my first NSF SaTC EDU award while Ellie is now taking over as the PI for CyberPDX after arriving at PSU in 2017. I believe enabling their success has been one of the most productive things I've done since promotion. I also attempted to mentor Fang Song, who left after achieving success on his own.

Publication-wise, I've produced papers in each year of USENIX's Advances in Security Education: the main venue for security education research while releasing source code and web sites that allow our work to be used by others. Lewis and Clark College, Evergreen State College, Lincoln High School, and Village Home Resource Center are some of the schools using our software and curricula.

## Teaching:

I've mainly focused my attention on modernizing our curriculum with the goal of offering courses that

can get students jobs immediately after graduation. Specifically, I've developed (or am currently developing) 3 courses since promotion:

- CS 495/595: Web Security
- CS 430P/530: Internet, Web, and Cloud Systems
- CS 410/510: Introduction to Blockchain

I've also updated the Malware course with essential material related to smart fuzzing and symbolic execution: two mechanisms that were deployed in all of the major systems in DARPA's CGC. I believe these courses offer the best pathway for students to get a job upon graduation and several have indicated this to me in comments that can be found at <https://thefengs.com/wuchang/cv/teaching.html> My ratings for courses taught in 2017-2018 were Web Security (4.7/5.0), Malware (4.7/5.0), New Beginnings (5.0/5.0), Internet & Cloud Systems (5.0/5.0), and Computer Security Seminar (joint with Charles Wright) (4.8/5.0).

Finally, I've helped develop and shepherd two additional courses. The first is Simon Niklaus's CS 465P/565: Full-stack Web Development, a course that was conspicuously absent in our offerings before last year. With this course, I guided it through the course approval process, so it could get a regular number and I have helped staff this course by finding and recruiting instructors to teach it. The course instantly fills up whenever we are able to offer it. With the help of Charles Wright, I have also revived CS 576: Computer Security Seminar. Student evaluations for this course were extremely positive. With these courses, I believe our offerings are competitive compared to what is being offered at other institutions and on-line.

## **Service:**

### Internal service

- Mentor for the CTF security club for students (2013-current)
- Organizer for the annual OregonCTF competition that features students from across the state. (2012-2017)
- Member of the Academic Computing and Information Technology Advisory Committee (ACITAC) (2016-current)
- Department committees including Graduate Admissions, Faculty search (TTF and NTTF), Executive, and Awards/Scholarship committees.
- Numerous faculty P&T subcommittees.
- Helping the ongoing effort to take the best practices of the New Beginnings model and apply it to our undergraduate curriculum. That successful students were able to succeed in the Master's program after a compressed 9 month curriculum brought to light how inefficient our long pre-requisite chains are in our regular programs. (2016-current)
- Led the first update to the Master's degree in 20 years. (2018)
- Cultivated adjunct instructors that can help offer popular courses including Full-stack Web Development, Web Security, Computer Systems Programming, and Internet, Web, and Cloud Systems.

- Mentor for high-school internships through Saturday Academy's ASE program (2005-current)
- Facilitator and curriculum content provider for Saturday Academy's CyberAcademy high-school summer camp. (2014-current)
- WiCS Hackathon judge (2018)
- AWS Immersion Day organizer (2018)
- URMP mentor (2016)

#### External service

- Invited talks and papers: Google Faculty Institute panel (2018), BSidesPDX (2016-current), NSF/NIH National Workshop on Computing Challenges in Future Mobile Health Systems and Applications (2014)
- Marketing interviews Let's Get Mental podcast (2018), Portland Radio Project podcast (2017), Multnomah County Library "Everybody Reads" technology & society roundtable (2018)
- NSA/NSF GenCyber workshop (2017)
- NSF panelist (2012-current)
- USENIX Advances in Security Education program co-chair (2017-current)
- Technical Program committee service
  - USENIX ASE (2016-current)
  - NetGames (2012-2017)
  - NOSSDAV (2012-2016)
  - MMSys (2015)
  - NPSec (2014)
  - Global Internet (2014)
  - MMVE (2012)
  - ICDCS (2012)
  - ACNS (2012)
- Transactions on Information Forensics and Security reviewer (2015), MMS Journal (2012), IEEE Transactions on Parallel and Distributed Systems reviewer (2012)
- Hour of Code offerings to elementary schools (2013-2015, 2017)
- Panelist Portland Business Alliance cybersecurity forum (2013)