

Aditya Basu

blog:// adityabasu.me
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Bio. I am interested in *systems security* and *operating systems* research. Recently, I have been investigating the security implications of the adoption of case-insensitivity by *ext4*. In the past, I have worked on compilers for alphanumeric shellcode generation, and designed security-focussed hardware extensions for RISC-V.

Education **PhD Student** in *Computer Science* (exp.) 2023
at *Pennsylvania State University*, PA, USA
GPA: 3.85 (of 4)

B.Tech. in *Information and Communication Technology* August 2014
from *Dhirubhai Ambani Institute (DAIICT)*, Gujarat, India
GPA: 9.52 (of 10) in major, 8.55 overall

Referred Publications **2023 Unsafe at Any Copy: Name Collisions from Mixing Case Sensitivities.**
Aditya Basu, Jack Sampson, Zhiyun Qian, Trent Jaeger. In *21th USENIX Conference on File and Storage Technologies (FAST '23)* (to appear).
Awarded **USENIX Student Grant**.

2020 Automatic Generation of Compact Printable Shellcodes for x86.
Dhrumil Patel, *Aditya Basu*, Anish Mathuria. In *14th USENIX Workshop on Offensive Technologies (WOOT '20)*.
(acceptance rate: 33.33%, or 12/36)

2020 Hardware Assisted Buffer Protection Mechanisms for Embedded RISC-V. Asmit De, *Aditya Basu*, Swaroop Ghosh, Trent Jaeger. In *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems*.
(doi: 10.1109/TCAD.2020.2984407, impact factor = 2.168)

2019 FIXER: Flow Integrity Extensions in Embedded RISC-V. Asmit De, *Aditya Basu*, Swaroop Ghosh and Trent Jaeger. In *Proceedings of Design, Automation and Test in Europe (DATE)*.
(doi: 10.23919/DATE.2019.8714980, acceptance rate: 24%)

2014 Automatic Generation of Compact Alphanumeric Shellcodes for x86.
Aditya Basu, Anish Mathuria, Nagendra Chowdary. In *Proceedings of 10th International Conference on Information Systems Security (ICISS)*.
(doi: 10.1007/978-3-319-13841-1_22, acceptance rate: 19%, or 25/129)

Posters & Demos **Sept. 2022** [Poster] **Provenance using Process Introspection** at *Collaborative Research Alliance (CRA) Bootcamp, University of California, Irvine.*

Aug. 2020 [Demo] **Flexible Process Monitoring with the Process Firewall** at *TPCP Software Security Summer School (SSSS'20).*

June 2019 [Poster] **Execution Integrity** at *Total Platform Cyber Protection (TPCP), Northeastern University.*

April 2017 [Poster] **CFI Enforcement on the Linux Kernel** at *Industry Day — Institute for Network and Security Research (INSR), PENNSTATE.*

Industry Experience

Research Intern, Microsoft Research, Redmond, WA, USA Summer 2022
I implemented techniques to support rollback resistance for distributed storage systems run by untrusted cloud providers. (This work is currently under peer review.)

Skills: Golang • Java • HDFS • Bash • LXC Containers • Docker

Software Engineering Intern, Google, Cambridge, MA, USA Summer 2019
I added support for Intel VT-d to the Akaros kernel allowing any PCI/PCIe device to be placed in the address space of a process or a VM. I also wrote the driver for Intel's DMA accelerator (IOAT).

Skills: C • QEMU • gdb • x86 Assembly | **Code:** github.com/brho/akaros

Product Security Intern, NIO, San Jose, CA, USA Summer 2018
I pen-tested ES8's (SUV) firmware via the OBD-II diagnostics port and wrote a driver for an on-board network switch.

Skills: C • Python

System Operations, Media.net, Mumbai, India 2014 - 2016
I automated and managed the web crawling infrastructure that served >100 million reqs./day. I also helped with recruiting and conducted training sessions on (i) *Advanced Linux*, and (ii) *Networking* for the new recruits.

Skills: C • Python • Java • Bash • AWS • Puppet • Ansible • Docker • Mesos • Hadoop

Software Developer Intern, DAIICT, Gandhinagar, India Summer 2013 & 2014
I wrote the web application for the admission portal of the university. The portal generated merit-lists and wait-lists of candidates based on their stream preferences and standardized test scores.

Skills: Python • Django Framework • HTML • CSS • Javascript • PostgreSQL

Assistantships

Lead Teaching Assistant, PENNSTATE – CMPSC473: Operating Systems
Spring '23 - current

Research Assistant, PENNSTATE Fall'18 - Fall'22
Teaching Assistant, PENNSTATE – CMPSC473: Operating Systems Spring '18
Research Assistant, PENNSTATE 2017
Teaching Assistant, PENNSTATE – CMPSC473: Operating Systems Fall '16
Teaching Assistant, DAIICT – IT215: Systems Software Spring '14

Skills

>10k lines: C • Python • Golang • bash • \LaTeX (macros) • HTML
5k – 10k lines: x86 Assembly • Django • Puppet • Ansible • Java • CSS
Utilities: make • git • Docker • strace • gdb
Others: Linux • Mac OS X • Markdown • HDFS • IDA Hex-Rays • Intel® Processor Trace

Awards

2023 USENIX Student Grant for FAST '23
2014 Highest CGPA in baccalaureate among wards of SVB trust
2011 Highest percentage in HSC among wards of SVB trust
2010 In *top 2.5 percentile* of All India Engineering Entrance Examination (AIEEE)
2010 97.5/120 in Gujarat Common Entrance Test (GUJCET)
2007 Certified 'A' grade in Intermediate Drawing, Gujarat State Exam. Board

Extracurriculars

Fall '20 - Spring '23 President of *Shotokan Karate-do Club* at PENNSTATE.
2020-22 President of *Social Dance Club* at PENNSTATE.
2019-20 Coordinator of *Argentine Tango (of Social Dance Club)* at PENNSTATE.
2013 Started the *Linux Pack Club* at DAIICT.