Abhimanyu Rawat

Massy, Paris, France

+33 75299 0872 • abhimanyur2010@gmail.com
ABresting.github.io

Researcher in Distributed Systems and Security, supported by Marie Curie Fellowship. Ex-Software Engineer at EMC^2 (now DellEMC), Pune in DDOS(Data Domain Operating System) team. Passionate about Distributed Computing, Computer Networks and Compilers, with strong technical, problem solving, leadership and interpersonal skills for working in a team.

Experience

- **PhD Student at UPF, Barcelona** — **Barcelona, Spain**
  Distributed Systems and Security(Blockchain) — *October 2019 – Present*

- **Research Engineer at Bell Labs** — **Paris, France**
  Distributed Systems and Security(Blockchain) — *October 2019 – Present*

- **Research Assistant at Linkoping University** — **Linkoping, Sweden**
  Computer Networks and Security , mentored by Prof. Andrei Gurtov — *February 2019 – September 2019*

- **Software Engineer at EMC(Now DellEMC)** — **Pune, India**
  Protocols Engineer, Data Domain Operating System — *July 2017 – January 2019*

- **Google Summer of Code Intern - Ste||ar Group (HPX)** — *May 2017 – July 2017*
  Mentored by: Bryce Adelstein Lelbach, Researcher and Software Engineer, Lawrence Berkeley National Laboratory, CA, USA

- **Software Engineering Intern at EMC** — **Pune, India**
  Mentored By Somnath Gulve, Director, Protocols Development — *January 2017 – June 2017*

- **Application Development Intern at Navayuga Info. Spatial** — **New Delhi**
  Mentored by Gaurav Gandhi, VP Software Engineering — *May 2013 - June 2013*

Education

- **Birla Institute of Technology and Science (BITS Pilani)** — **Pilani Campus**
  Master of Engineering, Computer Science , First Division(8.03 CGPA) — *2015 - 2017*
  Teaching Assistant x 6, on-campus course instructor

- **Apeejay College of Engineering, Sohna** — **Gurugram**
  Bachelor of Technology, Computer Science , Honored First Division — *2009 - 2013*

Computer skills

- **Programming Languages:** Proficient in: C, C++, Python, Solidity, Git, bash, TeX
  Also basic to Moderate ability in: Lisp, Java, JS, R
- **Industry Software Skills:** Wireshark, mininet, ns-2, Omnet++, Django, Flask, Android SDK, MySQL, MongoDB, Docker, Raspberry Pi and more
- **Operating Systems:** Linux, Windows, iOS

Publication and Seminar

- Decentralized Firmware Attestation for In-Vehicle Networks, 5th ACM Cyber-Physical System Security Workshop (CPSS 2019), Mohammad Khodari, Abhimanyu Rawat, Andrei Gurtov, Mikael Asplund
- Trends and Detection Avoidance of Internet-Connected Industrial Control Systems, EEE Transactions on Industrial Informatics as a SS on Security and Privacy in Industry 4.0 (IEEE ACCESS, 2019), David Hasselquist, Abhimanyu Rawat, Andrei Gurtov(Accepted, to appear)
- A Novel Energy Optimization Approach for Artificial Intelligence-enabled Massive Internet of Things, SummerSim 2019, International Symposium on Performance Evaluation of Computer and Telecommunication Systems (SPECTS), Ali Hassan Sodhro, Mohammad S.Obaidat, Sandeep Pibhulal, Gul Hassan Sodhro, Noman Zahid and Abhimanyu Rawat
- Examining the initial usability, acceptability and feasibility of a digital mental health intervention for college students in India, (International Journal of Psychology 2019), Kanuri, N., Arora, P., Talluru, S., Colaco, B., Dutta, R., Rawat, A., Taylor, C. B., Manjula, M., Newman, M. G.
- Hybrid Data-centre Scheduling, by Abhimanyu Rawat and Arpit Srivastav, Research Seminar Dec. 2016, BITS Pilani Campus, Under Assist. Proff. Kuldeep Kumar (Ph.D. NUS Singapore)

Masters Thesis Supervision

- Vendor-Independent Software-Defined Networking - Santiago Pagola Moledo, Ericsson
- Time Distribution in Secure Systems - Daniel Mansson, SAAB Systems
- Implementation and evaluation of the ACE-protocol stack over 6LoWPAN - Jaocb Johansson, Attentec AB
- Co-supervised two independent research studies on IoT trends on Industrial Control Systems at LiU

Awards and Achievements

- Winner Blockchain Hackathon at IMDEA Software Institute in Madrid, Feb. 2020
- Winner(1st Prize) IC3 Blockchain Camp 2020(July-Aug) hosted by IC3 and Cornell University
- Winner Student prize at Copernicus Hackathon held at Science Park at Graz on 15-16 Oct., 2020
- Stood in top 40 students among 10000 students appeared for BITSAT Higher Degree entrance exam 2015
- Merit Scholarship cum. 40% Fee Wavier, BITS Pilani, offered only to 5% of the higher degree students
- National Eligibility Test (NET-exam) qualified in first attempt, eligible for lecturership and Ph.D.(Govt. Sponsored) in any university across India, Only 6% of students qualify, GATE Qualified 2015
- ACM International Collegiate Programming Contest(ICPC) - Honorable mention, 2013 organized by IIT Kanpur, 3rd in Codility Titanium 2016 Challenge, Semifinalist in HackerRank University World Cup 2015

- Identified bug in payment processing portal of Flipkart.com, TheMobileStore.in and ccavenue.com, showing discrepancy with payment module.
- First prize in Debugging contest and Junkyard wars at Contrivance, Technical College Festival(20+ colleges)

Extra-Curricular and Interests

- Certified Scrum Master, by Scrum Alliance Certificate ID 000837249 .
- Coursera certification on Cryptography - Stanford by Dan Boneh and Cloud Networking by Ankit Singla(ETH Zurich) and Brighten Godfrey(UIUC).
- Qualified multiple Government of India's group A service exam.
- Fast Sudoku and Rubik's cube solver for fun, big sitcom fan, avid reader, board game geek, culinarian.

OVERVIEW OF PAST WORK

Protocols Engineer, EMC (DellEMC), Pune, India

- Developer of CIFS protocol based features, supports SMB 1,2,3 and internal implementations for some other modules. Maintainer of the Protocols section upgrade infrastructure and authentication service backed by Kerberos and Active Directory. Focus on delivering customer impacting features more on a daily basis. Implementing the scale-out feature for CIFS protocol.

Project Information

- **DDOS Protocols:** Data domain operating system is the propriety operating system which runs on top of CentOS patched accordingly as per the product needs. DDOS tenants multiple network file sharing services like NFS, CIFS and BOOST(in-house). I handle CIFS related features like making sure it supports the scale-out feature from the scratch, with initial work around features. In the midst, I learned the whole upgrade infrastructure(software side). Patched the SMB1 vulnerability for the product. I find occasional fun uncovering/filing product bugs (20+ so far).
- **Agile Development - Scrum Master :** At DellEMC we follow the agile methodology in development, I am also the Scrum Master, responsible for sprint planning i.e. creating the development stories/tasks which aligns with our future development strategy to meet our business ends. At daily stand ups I account each developer for the work they have done and accordingly set the coming targets. Eventually after each spring I give presentations to the engineering-managers and draft the future development direction.

EMC - (Master's Thesis work)

Designed a service which runs on Data Domain Operating System, works in parallel with client side infrastructure, making sure that each and every service i.e. protocols, DNS, LDAP, Kerberos etc is running correctly. On client side, there are supplementary machines for DDR box such as DNS, Kerberos, NIS, AD server etc., which needs to work correctly all time with dynamic settings. Solely developed this tool from scratch, with my mentor and Professional Services people who provided customer data such as system logs, core dumps, bugs etc. and filtered the most frequent bad configurations. I used open-source tools such as Paramiko for connecting nodes, wrote the tool in python, learned about different protocols, found out some annoying features of some libraries which are mostly hidden/undocumented and makes system buggy. Parallelly discovered a few bugs in the DDOS. Service now works with DD boxes shipped across the globe.

Project Information

- **DDOS:** Data Domain Operating System, works for client side data backup, recovery and archiving. Network data protocol such as NFS, CIFS and EMC's propriety helps data flow across heterogeneous endpoints. Dynamic configuration among customer devices interrupts service.

- **Operational dependencies:** Working with thousands of client side service nodes in multiple domains and user groups, the need to setup the correct configured deployment is absolutely necessary. Any failure can be catastrophic for the overall system. I developed an adaptive solution as if one essential feature fails for a particular host then all depending checks will be excluded for that entity. Log trace is generated for further analysis.
- **Command line Interface, GUI with multi-OS compatibility:** As deliverable, a Command line Interface with logging to run analytics on and a human-readable web report is integrated. Used PyIntaller for packaging and Flask as a unit server for portable binaries. Executable for both Linux and windows are developed.

Selective College Projects

I worked on diverse set of projects, involving Cloud Computing, Web platforms, Operating system, in-campus research projects etc. The learning experience not only enhanced my technical knowledge but also leadership skills. I have experience both managing up, working with head of the departments, advising professors, project directors etc., as well as managing down, leading a team of software developers. Details of some of my major projects (involving software design and development) are given below:

- **Mana Maali : A Stanford-BITS initiative:** *'Online Mental Health intervention platform'*

  An online platform for conducting mental health interventions for University students worldwide. It is a joint project in association with Stanford University and BITS Pilani(Development centre), with stakeholder from Palo Alto University, Penn. State, White Swan foundation and Sangath. Built platform on Django, MySQL and MongoDB. Platform has adaptive sessions for students with interactive features and an upcoming secure end-to-end chat module. Authorization tool for administrator, managing control over the content and people associated.

  I lead the product development team of 7 students/software developers under the supervision of Dr. Rahul Banerjee (Head of Department Computer Science, BITS Pilani). We developed this project from scratch, and continuing it's development for next phases.

- **Data-Center Scheduling using Hybrid approach**

  Improved the efficiency of the Data Centre scheduling Algorithms HAWK and Mercury, using the variable Cluster size and Task size of classifying it as short or long job. Observed a 10 percent time efficiency than previous approaches.

- **Semi-Autonomous bot using Raspberry Pi**

  Built a semi-automatic bot for real-time video streaming on college LAN network and detecting faces using open CV

- **Correlation analysis between text document using Hadoop Map-Reduce and OpenMPI**

  Developed Hadoop and OpenMPI job to read large set of text document, find the keywords in documents, then create a weighted graph for common keywords in document which was used for correlation analysis of the document corpus.

References

Available on request.