Nikhil Vanjani

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Research Interests

Blockchain Technology, Quantum Computing, Cryptography, Cyber Security, Machine Learning

Education

Year	Degree	Institute(Board)	Performance
2014-2018(expected)	B.Tech., Computer Science and Engg.	Indian Institute of Technology Kanpur	7.9/10.0
2014	XII	Aklank Public School, Kota (CBSE)	89.2/100.0
2012	X	Welspun Vidya Mandir, Anjar (CBSE)	10.0/10.0

Scholastic Achievements

- **Red Hat Certified System Administrator (RHCSA)** — *2017*
- Secured 1st position in **Blockchain Hackathon** organised at Techkriti, IIT Kanpur — *2017*
- Secured Rank **461** in **Codechef Snackdown** Final Round among **8500** total teams — *2015*
- Secured **All India Rank 201** in **Joint Entrance Examination Advanced** among **1.5** lakh participants — *2014*
- Secured **All India Rank 2981** in **Joint Entrance Examination Mains** among **1.4 million** participants — *2014*
- Secured **Statewise Top 1 %** (Rajasthan State) in **National Standard Examination in Physics(NSEP)** held by **Indian Association of Physics Teachers**. — *2014*

Experience

- **Lucideus Inc.** | *Vidit Baxi, Lead, Enterprise Customer Service* — *May - July 2017*
    - Studied **CIS Benchmarks** for RHEL7, Cisco Switches
    - Articulated **security configuration controls** for **hardening** of Servers (HP - UX), Switches (Juniper, HP, 3COM), Firewalls VPN (Fortigate), Databases (MySQL 5.6, MSSQL 2008, 2014, 2016) to support automation of the company's enterprise product
    - Calculated CCSS scores for various attack vectors

- **IIT Kanpur New York Office** | *Prof. Manindra Agarwal, IITK* — *May - July 2016*
    - Developed an **online learning** collaborative filtering algorithm based on **matrix factorisation** for movie recommendation based on the users' ratings on other movies
    - Trained the model on **MovieLens 1M** dataset and optimized parameters
    - Designed a model incorporating collaborative filtering to generate news feed

Research Projects

- **Blockchain Technology** | *Prof. Piyush Kurur ; Prof. Arnab Bhattacharya, IITK* — report
    - Studied Bitcoins and Cryptocurrency Technologies online course from Coursera
    - Studied white papers of Bitcoin, Ethereum, Litecoin
    - Studying Silvio Micali's proposed algorithm -**Algorand** for Scaling Byzantine Agreements for Cryptocurrencies

- **Post-Quantum Cryptography** | *Prof. Rajat Mittal, IITK* — report
    - Studied about integer factorisation problem, discrete logarithm problem, elliptic curve based discrete logarithm problem and how they can be easily solved using **Shor's algorithm**
    - Surveyed recent advances in the field through the **PQCrypto Conferences**

- Studying **Lattice-based cryptography** and Oded Regev's paper - "On Lattices, Learning with Errors, Random Linear Codes, and Cryptography"
- **Darknet Attacks Analysis** | *Prof. Nasir Memon, NYU ; Prof. Sandeep Shukla, IITK* [report]
  - Studied about trap-based monitoring systems, operation of darknet, taxonomy of darknet data, extraction of insights on suspicious activities and threats on the Internet
  - Performed **darknet profiling** and **visualized geographical distribution** of attack attempts and port scans
  - Detected **Mirai botnet** and its variants on the various ports they operated on in accordance with the global observations of zero days
  - Leveraged Collective Intelligence Framework on a **honeypot-like network** to gain **cyber threat intelligence**

Other Projects

- **Securing Zoobar Web Server** | *Prof. Sandeep Shukla, IITK*
  - Studied the architecture of the zoobar web server - a model of **OKWS web server**, specialized for building fast and secure web services
  - Exploited security vulnerabilities using **Control Hijacking** techniques like buffer over-flow attacks, privilege escalation, broswer-based attacks like XSS, CSRF, SQL Injection, Side Channel Attacks, Phishing, Worms
  - **Improved security** using Stack Canaries, Privilege Separation and Server-Side Sandboxing
- **Video Summarisation** | *Prof. Piyush Rai, IITK* [report]
  - Surveyed various video summarisation techniques used in state of the art algorithms.
  - Implemented **VSUMM** algorithm and experiemnted with features obtained from SIFT, texture, color histograms
  - Implemented **Shot Boundary Detection** and **LSTM** based algorithms for generating video summary.

Technical Skills

- **Programming**: Python, C, Octave, LaTeX, Git, Bash, PHP, HTML/CSS, MySQL, Assembly
- **Softwares/Libraries**: MultiChain, TensorFlow, GDB (The GNU Project Debugger), Numpy, Django, Gnuplot
- **Operating Systems**: RHEL7 (RHCSA), Ubuntu, Kali Linux, Windows, HP-UX

Relevant Coursework

Theory		Systems	Algorithms & ML
Quantum Computing	Abstract Algebra	Computer System Security	Machine Learning Techniques
Modern Cryptology	Linear Algebra	Computer Networks	Algorithms II
Bitcoins & Cryptocurrency	Discrete Mathematics	Internet Technologies	Data Structures & Algorithms
	Probability & Statistics		

Leadership

- **Overall Coordinator, Outreach Cell** | *IIT Kanpur* *March 2017 - ongoing*
  - Founded the Cell, made its proposal from scratch and got it passed by the Students' Senate
  - Conducted Info Sessions at Delhi, Hyderabad, Kota and Open House at IIT Kanpur to help JEE Advanced 2017 Qualifiers and their parents with their queries
  - Lead the Institute's online campaign to help prospective students make an informed choice
  - Created and designed the special edition of the Institute Alumni Newsletter

Co-curricular Activities

- Mentored 20 students for a project on Overview of Cyber Security under Association of Computing Activities, IITK
- Mentored 8 students on a Blockchains based project for Medical Record keeping under Programming Club, IITK
- Reading Novels, playing Billiards, Table Tennis, Cricket, Swimming