Rohit Dwivedula

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Education

BITS Pilani — Hyderabad, India

B.E Computer Science & Minor in Physics. CGPA: 9.10/10 (Distinction) — *Aug. 2017 – Jul. 2021*

- Recipient of the **V.S. Rao Best All Rounder Award** awarded to **3** out of **1100** students in the Class of 2021 for overall achievement in academic, research, cultural, social, and leadership activities (2021).
- Recipient of the Institute Merit Scholarship given to top 3% of academic performers (2018).
- **Teaching Assistant** for Data Structures and Algorithms (CS F211), Software Engineering (IS F341) and Computer Programming (CS F111) over three semesters in the Dept. of Computer Science & Information Systems.

Experience

Research Intern — Jan. 2021 – Present

Microsoft Research — *Bangalore, India*

- Implementing a lightweight blockchain protocol for a decentralised news aggregation platform on *Blockene*
- Blockene is a lightweight split-trust protocol involving lightweight nodes (trusted) and powerful nodes (untrusted).
- Analysing the performance of the protocol by developing C++ and Java apps to simulate the block commit protocol. Deployed the system to 2200 Azure VMs across three geographical locations in the US.
- **Built with**: C++, Java/Android, gRPC, ansible, Azure

Research Intern — May 2018 – Jul. 2018

CSIR-CEERI — *Chennai, India*

- Developed a real-time system to interface with a Samsung smartwatch wirelessly & detect arrhythmias in wearers.
- System could successfully calculate heart rate and variability metrics with minimal error in < 5 minutes (when baselined against a finger pulse oximeter and an ECG), while syncing the results to an on-premises server realtime.
- **Built with**: Python3, scipy-signal, pyHRV, Java

Projects

BMP Multiobjective Optimisation | *Advisor: Prof. K. Srinivasa Raju, BITS Hyderabad*

- Best Management Practices (BMPs) are used to control surface runoff (or flooding) and reduce pollution in urban areas. Expressed the tradeoff between flooding, pollutant reduction and cost of construction mathematically.
- Implemented three multi-objective genetic algorithms (NSGA-II, NSGA-III and C-TAEA) to solve the BMP optimisation problem for the Greater Hyderabad Municipal Corporation Area area ($625km^2$). Results indicate upto 10^7m^3 of surface runoff could be reduced while removing approximately 100 tonnes of pollutant during extreme rainfall events.

Hierarchical CNN for Network Intrusion Detection | *Advisor: Prof. Chittaranjan Hota, BITS Hyderabad*

- Developed "TreeNets", a hierarchy of CNN models, to detect and classify malicious behaviour in networks.
- Used this model, in conjunction with binary gray wolf optimization (BGWO) feature selection, on the benchmark NSLKDD dataset. Achieved accuracy of 82.16%, comparable to state of the art approaches.

Publications

- Attention-based Bi-LSTM for Adaptive Anomaly Detection on Time Series.
Sanket Mishra, Varad Kshirsagar, Rohit Dwivedula and Chittaranjan Hota. International Conference on Artificial Neural Networks (ICANN), Lecture Notes in Computer Science, vol 12891. Springer (2021)

- ABLE: Attention Based Learning for Enzyme Classification.
Mohan Vamsi Nallapareddy & Rohit Dwivedula. Journal of Computational Biology and Chemistry (2021)

- Multiobjective optimisation & cluster analysis in placement of best management practices in an urban flooding scenario.
Rohit Dwivedula, R. Madhuri, K. Srinivasa Raju, A. Vasan; Journal of Water Science & Technology (2021)

- Robust Detection of Network Intrusion using Tree-based Convolutional Neural Networks.
Sanket Mishra, Rohit Dwivedula, Varad Kshirsagar, and Chittaranjan Hota. In Proceedings of the Conference on Data Science and Management of Data (8th ACM IKDD CODS & 26th COMAD), pp. 233-237. (2021)

- Transitioning from Plan-driven Methods to Agile Methods - Preparation for a Systematic Literature Review
Rohit Dwivedula & Narasimha Bolloju, 5th International Conference on Communication and Electronics Systems (2020)

Other Information

- **Coursework**: Artificial Intelligence, Information Retrieval, Cryptography, Software Engineering, Operating Systems, DBMS, Data Structures and Algorithms, Computational Physics, Classical Mechanics, Electronmagnetic Theory.
- **Languages/Skills**: Python, Tensorflow, C++, MERN stack, Java, PHP, MySQL, Arduino Programming.
- Won **2nd place** and Rs. 50,000 at InnoHack 7.0 out of 40+ teams. Built a machine learning system to detect maintenance issues in heavy machinery and integrated it with a dashboard built in MERN. (Feb 2020)
- **Extracurricular Activities**: Debate & MUNs, writing non-fiction, Placement Coordinator (2020-21)