

# Sharat Chandra Madanapalli

✉ sharat910@gmail.com | ☎ +91 8740 912 916 | 🌐 sharat910 | in Sharat Chandra

## EDUCATION

---

- **Birla Institute of Technology and Science Pilani** Pilani, India  
*Bachelor of Engineering (Honours) in Computer Science; GPA: 9.31/10.0* *Aug. 2014 – Present*
- **FIITJEE Junior College** Hyderabad, India  
*Higher Secondary School; Mark: 97.7/100* *July. 2012 – May. 2014*

## EXPERIENCE

---

- **University of New South Wales** Sydney, Australia  
*SDN Research Intern — Supervisor: Prof. Vijay Sivaraman* *May 2017 - Present*
  - **iTelescope**: A scalable SDN-based solution that identifies and classifies video streaming flows in real-time. (Demoed at SDN NFV World Congress 2017 held in The Hague, Netherlands in the Noviflow Booth.)
  - **Packet Processing Engine**: Built a scalable packet processing system in Rust using Netbricks and DPDK to extract packet headers and collect flow-level attributes of network traffic at 10 Gbps.
  - **Elephant Flow Detection**: Performed a statistical analysis of campus traffic to build an optimal methodology for the existing architecture to detect, isolate and monitor elephant flows in real-time.
  - **System Optimization**: Designed an efficient data processing pipeline, optimized OpenFlow table structure and used Streaming Algorithms to improve system efficiency to detect video streams.
  - **QoS and Traffic Management**: Developed a traffic shaping and management framework using OpenFlow meters and queues supporting dynamic Quality of Service provisioning on the detected elephant and video streams.
- **Centre for excellence in SDN, BITS Pilani** Pilani, India  
*Undergraduate Research Assistant — Supervisor: Prof. Rahul Banerjee* *Jan 2016 - May 2017*
  - **Project Flexnet**: A framework facilitating easy deployment and coexistence of SDN networks with traditional networks and also enhancing performance of the end-host applications with the help of SDN.
  - **Multi-domain SDN Controller interaction**: Carried out investigations into co-existence of controllers in SDN via Vertical (Master Controller) and Horizontal (ODL's SDN-i protocol) interfacing approaches.
  - **Global topology generation**: Developed a framework which assimilates global network state information from distributed controllers running on disjoint but connected network domains by modifying the LLDP mechanism.
  - **Graph-based Network Management**: Created an endpoint API to facilitate better network management by exposing the data plane network topology and state information through Neo4j Graph database.
  - **Test-bed Monitoring**: Created a monitoring framework using OpenFlow network stats and tools like collectd and Grafana to enhance visibility into compute and network resources utilization for SDN test bed.
  - **Cloud Deployment**: Worked on virtualization technologies and deployment and orchestration of a mini-cloud environment in the lab.
- **Indian Institute of Remote Sensing** Dehradun, India  
*Research intern — Supervisor: Dr. Sameer Saran* *June 2016 - July 2016*
  - **Project DataCube**: An analytical framework that supports effective storage and retrieval of large earth observation datasets by converting the entire data into multi-dimensional storage structure.
  - **Auto-archival System**: Designed an efficient system to decompress and maintain the queried datasets in a cache area and automatically compress the remaining large datasets.
  - **iPython query interface**: Built a server and client interface using iPython to facilitate dataset analysis in the observational (spectral), temporal and spatial domains in a wide range of permutations.

## RESEARCH PUBLICATIONS

---

- **Real-time Detection, Isolation and Monitoring of Elephant Flows using Commodity SDN System – IEEE/IFIP Network Operations and Management Symposium (NOMS) '18:**  
*Sharat Chandra Madanapalli, Minzhao Lyu, Himel Kumar, Hassan Habibi Gharakheili, Vijay Sivaraman*

## PROGRAMMING SKILLS

---

- **Languages**: Python, C, C++, Java, Matlab, P4, Rust, Go, Javascript, L<sup>A</sup>T<sub>E</sub>X, SQL
- **Frameworks and Technologies**: Git, Docker, Ryu Controller Framework, TensorFlow, Django

## OTHER PROJECTS

---

- **Content based Image Retrieval using CNNs** BITS Pilani  
*Machine Learning, Computer Vision* November 2016  
Built a multi-layer deep Convolutional Neural network architecture which served as a model to perform the task of Content based Image Retrieval. Using the activation values of the penultimate layer of the trained CNN as the feature vector for the input image, the Content Retrieval Engine fetches similar images from the previously indexed (using KD-Trees) database.
- **Language Entity Tagger and Semantic Clustering of News Articles** Tofler, Gurgaon  
*NLP, Deep Learning* May 2016  
Developed an API endpoint that tags important entities in news articles using POS and NER. Also, built a semantic clustering framework for news articles using Convolutional Neural Networks. Semantic features in news articles were derived using a trained Word2Vec model and the important entities tagged. The clustering framework was able to classify news articles into various categories with an accuracy of 92%.
- **Location Safety Index prediction based upon crime rate analysis** BITS Pilani  
*Routing Algorithms, Information Retrieval* January - February 2016  
Built an application which predicts the safest path between two places and forewarns against approach towards an unsafe route using crime rates observed in the locality based on crime news articles. This web application uses NLP techniques to tag locations in news articles, TFIDF to de-duplicate them and with the support of Maps API and custom routing algorithms provides safest path between two locations. This project won the 1st Place in APOGEE 2016 (Technical Fest of BITS Pilani).
- **SocioConnect: A social network for NGOs in India** BITS Pilani  
*Server Management, Web Development* December 2015 - February 2016  
Built the interactive web based social portal using Django Framework containing features such as User Authentication, Posts, Queries, Profiles and Community. Deployed the server on AWS cloud using the Bitnami Django Stack. Done as community service for National Service Scheme (NSS India).

## SCHOLASTIC ACHIEVEMENTS AND AWARDS

---

- Ranked 15/50 teams in **Microsoft Build The Shield Finals India 2016**: A cyber-security challenge
- BITS Pilani **Merit Scholarship recipient** (2014): Top 2% of the students in the university
- **All India Rank 51** in National Level Science Talent Search Examination (NSTSE-2014)
- Recipient of Munshi Award for excellence in Mathematics (School Topper)

## RELEVANT COURSES

---

- |   |   |  |
|---|---|--|
| • Computer Networking and Systems <ul style="list-style-type: none"><li>◦ Computer Networks</li><li>◦ Software-Defined Networks</li><li>◦ Data Storage Networks</li><li>◦ Network Programming</li><li>◦ Operating Systems</li><li>◦ Computer Architecture</li></ul> | • Programming <ul style="list-style-type: none"><li>◦ Principles of Programming Languages</li><li>◦ Data Structures</li><li>◦ Design and Analysis of Algorithms</li><li>◦ Object Oriented Programming</li></ul> | • Others <ul style="list-style-type: none"><li>◦ Machine Learning</li><li>◦ Artificial Intelligence</li><li>◦ Database Systems</li><li>◦ Compiler Construction</li><li>◦ Multimedia Computing</li><li>◦ Image Processing</li></ul> |
|---|---|--|

## EXTRA-CURRICULARS

---

- Joint Publicity Coordinator at BITS Pilani student chapter of **Association of Computing Machinery**
- Member of **Computer Science Association** at BITS Pilani: Created and led events in technical festivals
- Member of **Gurukul (Music Community)** of BITS Pilani: Guitarist, Keyboardist and Vocalist
- Member of **Photography Club** at BITS Pilani