Rakesh Bal

3rd Year Undergraduate
Department of Computer Science And Engineering

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Academic Qualifications

Year	Degree/Certificate	Institute	CPI/%
2016 - Present	B.Tech	Indian Institute of Technology, Kharagpur	9.18/10
2016	CHSE, Odisha(XII)	BJB Junior College, Bhubaneswar	89%
2014	ICSE(X)	St. Josephs High School, Bhubaneswar	96%

Research Interests

Machine Learning, Computer Vision, Social Computing Systems, Algorithm Bias

Scholastic Achievements

- Secured **All India Rank 265** in **JEE Advanced 2016** among the 1.2 Lakh shortlisted candidates.
- Among the top 0.02% of the 1.5 million applicants in JEE Mains 2015.
- Secured **Air India Rank 191** in Kishore Vaigyanik Protsahan Yojana conducted by Indian Institute Of Science.
- Qualified for Indian National Physics, Chemistry and Astronomy Olympiad conducted by HBCSE.
- Qualified **National Talent Search Examination** conducted by NCERT in Xth standard.

Key Projects

- **Discovering and Mitigating Algorithmic Bias using Deep Neural Networks** (*April'18-Ongoing*)
  Mentor: Prof. Niloy Ganguly, Department of Computer Science And Engineering.
  - Working on discovering bias in COMPAS dataset using deep neural networks.
  - Formulating ideas for its mitigation using **Layerwise Relevance Propagation** technique.
  - Working on extending the discovery of bias to various others datasets like Census Income dataset.
  - Used various types of neural netwrok architectures and other types of ML techniques like gradient boosting.
- **Election Optimizationin Recommendation Fairness** (*Oct'18-Ongoing*)
  Mentor: Prof. Niloy Ganguly, Department of Computer Science And Engineering.
  - Working on determining fairness in recommender systems using election voting methods.
  - Used traditional recommender system algorithms like Matrix factorization on SmartMedia Adressa News Dataset.
  - Applied the theory of electoral systems like Single Non-Transferable Vote, k-Borda count, Bloc Voting, Monroe Count, Chamberlin-Courant etc to measure fairness.
- **AI Team Member, Autonomous Underwater Vehicle, IIT Kharagpur** (*Feb'17-Ongoing*)
  Mentor: Prof. CS Kumar, Department of Mechanical Engineering.
  - Implemented real time under water buoy detection using **Single Shot MultiBox Detector** on the top of **MobileNet**.
  - Used various types of neural netwrok architectures and other types of ML techniques like gradient boosting.
  - Created a simulator for Underwater Vehicles using Gazebo.
  - Used Actionlib and Smach Packages of ROS to create Mission Planner Stack on Kraken 3.0.

Technical Skills

- **Programming Languages:** Python, C, C++, MATLAB/Octave, Java, Verilog
- **Software and Libraries:** Git, OpenCV, ROS, Tensorflow, Keras, PyTorch, Numpy, Pandas, Scikit-Learn

Relevant Courses

Algorithms-I & II	Probability And Statistics
Discrete Structures	Linear Algebra
Formal language And Automata Theory	Introduction to Electronics
Switching Circuits And Logic Design	Deep Learning Specialisation, Coursera
Computer Organisation And Architecture	Knowledge Modeling And Semantic Technologies
Compilers	Deep RL, UC Berkeley*(ongoing)
Operating Systems*(ongoing)	Machine Learning*(ongoing)
Computer Networks*(ongoing)	Educational Data Analytics*(ongoing)

Extra-Curricular Activities

- Represented LBS Hall, IIT Kharagpur in InterHall Maths Olympiad General Championship.
- Secured 4th position in the Science Quiz held by Institute Of Physics, Bhubaneswar.
- Qualified for semifinals of debating tournament conducted by Debating Society, IIT Kharagpur.
- Interned at National Digital Library preparing solutions for Previous years JEE Question Papers for NDL JEE Archive.
- Successfully organized Shuffle Event as a crew member in Spring Fest, 2017 and prepared music tracks for the event.