Ashutosh Chaubey

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Education

2017 - 2021	**Bachelor of Technology**, *Computer Science and Engineering*, Indian Institute of Technology, Roorkee, **CGPA 9.724/10.0**.
2017	**All India Senior School Certificate Examination**, *Delhi Public School, Bhilai*, **97%**. (Central Board of Secondary Education)
2017	**All India Secondary School Examination**, *Delhi Public School, Bhilai*, **CGPA 10.0/10.0**. (Central Board of Secondary Education)

Publications and Preprints

2020	**Universal Adversarial Perturbations : A Survey**, ↗, **Ashutosh Chaubey***, Nikhil Agrawal*, Kavya Barnwal, Keerat K. Guliani, Pramod Mehta, Preprint arXiv :2005.08087. **[arXiv Preprint Link]**
2019	**A GAN-based Ensemble Technique for Automatic Evaluation of Machine Synthesized Speech**, ↗, Jaynil Jaiswal*, **Ashutosh Chaubey***, Bhimavarapu Sasi Kiran Reddy, Shashank Kashyap, Puneet Kumar, Raman Balasubramanian, Partha Pratim Roy, Published in the 5th Asian Conference on Pattern Recognition (ACPR) 2019. **[Paper Link] [Presentation Link] [Poster Link]**

Research Experience

May 2020 - Jul 2020	**Research Intern**, Big-data Experience Lab, Adobe Research India.
	— Used deep Q learning to learn an optimal acquisition function for active learning by modelling the active learning scenario to a Markov Decision Process.
	— Reduced the annotation effort by using a weak learning setting where the annotator just has to verify the current model predictions on acquired samples.
	— Used the human feedback from verification and the class imbalance in the acquired samples as an additional reward.
	— Implemented the proposed technique using PyTorch framework and used Flask to build an interactive demo including the annotation framework.
	— **Patent** currently under the legal process of filing.
May 2019 - Jul 2019	**Research Intern**, Video Analytics Lab, Indian Institute of Science, Bengaluru.
	— Worked on multi-person human pose prediction using synthetic dual person dataset.
	— Due to unavailability of enough training samples, developed a pipeline using Open CV to generate synthetic dual person dataset and their annotations.
	— Also worked on full human body shape prediction to predict the SMPL parameters of a person from single RGB image.
	— Implemented the proposed techniques using Tensorflow framework and used OpenCV for creating synthetic videos.

Projects

Jan 2020 - Apr 2020	**Survey on Universal Adversarial Perturbations**, ↗.
	— Comprehensive survey on attacks and defenses involving universal adversarial perturbations.
	— Compared existing techniques based on their fooling rates, ease of deployment and amount of data required.
	— Paper under review at ACM Computing Surveys (CSUR) - **[arXiv Preprint Link]**.
Jan 2020 - Mar 2020	**Vehicle Speed Estimation using Deep Neural Networks**, under Prof. Raksha Sharma, IIT Roorkee.
	— Developed a pipeline for vehicle speed estimation using CNNs and using PyTorch framework.
	— Experimented with the trained neural network to understand the model's sensitivity to certain parts of the input.

Jan 2019 - Apr 2019	**Automatic Evaluation of Machine Synthesized Speech**, ⤤, under Prof. R. Balasubramanian, IIT Roorkee.
	— Developed an ensemble based technique which uses discriminator from a speech synthesizing GAN to generate "humanness score" of machine synthesized speech.
	— Proposed a new metric - *Anthropomorphic Score*, free from human intervention, for evaluation of synthetic speech from Text-to-Speech models.
	— **[Paper Link] [Presentation Link] [Poster Link]**
Feb 2019	**Variational Autoencoder for MNIST**, ☉.
	— Implemented the "Auto-encoding Variational Bayes" paper using PyTorch framework.
	— Carried out experiments with generations using the MNIST dataset, trying out different loss functions for training.
	— **[GitHub Link]**
Dec 2018	**One shot learning using Siamese networks**, ☉.
	— Implemented the "Siamese Neural Networks for One Shot Image Recognition" paper using PyTorch framework.
	— Carried out experiments using the Omniglot dataset, involving different loss functions to improve accuracy.
	— **[GitHub Link]**
Nov 2018	**Classifying Names with Character-level RNN**, ☉.
	— Trained a classifier using vanilla RNNs which can classify the nationality of person based on his/her name.
	— **[GitHub Link]**

Achievements

Present	**Department Rank 2** out of 78 students in the IIT Roorkee Computer Science batch of 2021.
2019	Represented IIT Roorkee in **Student Academic Conference, Inter IIT Tech Meet 2019**.
2017	Secured **All India Rank 402** in **JEE-Advanced** out of 0.2 million candidates.
2017	Secured **All India Rank 575** in **JEE-Main** out of 1.2 million candidates.
2017	Secured place among **National Top 1%** in **National Standard Examination in Chemistry**.
2017	Secured place among **National Top 1%** in **National Standard Examination in Physics**.
2016	Shortlisted for the **Kishore Vaigyanik Protsahan Yojana Fellowship award**.
2015	Awarded **National Talent Search Examination** Fellowship by **NCERT** under the HRD ministry, Govt. of India.

Extracurricular Activities

Apr 2020 - present	**Chair**, IIT Roorkee ACM Student Chapter.
	— ACM is the world's largest educational and scientific computing society which delivers resources that advance computing as a science and a profession.
	— Head of the student chapter, responsible for organizing events to promote core computer science fields in IIT Roorkee.
Apr 2020 - present	**Co-President**, Vision and Language Group.
	— VLG aims to foster a deep learning research community within the campus through regular open discussions, workshops and by undertaking various research projects.
	— Responsible for scheduling group activities and managing the administrative front of the group.
Nov 2020 - present	**Student Mentor**, Student Mentorship Program IITR.
	— Mentoring freshmen for their smooth transition to campus life, motivating their academic and co-curricular endeavors.

Skills

Programming Languages	Python, C, C++, Java
Software Packages	Tensorflow, PyTorch, Matplotlib, Scipy, Numpy, Opencv-python, Node.js, Django