

Ashutosh Chaubey

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Education

- 2024 - 2029 **PhD in Computer Science**, *University of Southern California, Los Angeles*, Advisor - Prof. Mohammad Soleymani.
- 2017 - 2021 **Bachelor of Technology**, *Computer Science and Engineering*, Indian Institute of Technology, Roorkee, **CGPA 9.718/10.0 - Third-highest CGPA** amongst all the graduating students of IIT Roorkee 2021.

Publications and Preprints

- 2023 **Meta-Learning Framework for End-to-End Imposter Identification in Unseen Speaker Recognition**, Ashutosh Chaubey, Sparsh Sinha, Susmita Ghose.
[Paper Link] [Poster Link] - Published in the **IEEE Workshop on Automatic Speech and Understanding (ASRU) 2023**.
- 2022 **Improved Relation Networks for End-to-End Speaker Verification and Identification**, Ashutosh Chaubey, Sparsh Sinha, Susmita Ghose.
[Paper Link] [Poster Link] - Published in the **Interspeech 2022**.
- 2022 **OPAD : An Optimized Policy-based Active Learning Framework for Document Content Analysis**, Sumit Shekhar, Bhanu Prakash Reddy Guda, Ashutosh Chaubey, Ishan Jindal, Avneet Jain.
[Paper Link] [Patent Link] - Published in the **2022 IEEE CVPR Workshop on Fair, Data Efficient and Trusted Computer Vision**.
- 2020 **Universal Adversarial Perturbations : A Survey**, Ashutosh Chaubey*, Nikhil Agrawal*, Kavya Barnwal, Keerat K. Guliani, Pramod Mehta.
[Paper Link]
- 2019 **A GAN-based Ensemble Technique for Automatic Evaluation of Machine Synthesized Speech**, Ashutosh Chaubey*, Jaynil Jaiswal*, Bhimavarapu Sasi Kiran Reddy, Shashank Kashyap, Puneet Kumar, Raman Balasubramanian, Partha Pratim Roy.
[Paper Link] [Presentation Link] [Poster Link] - Published in the **5th Asian Conference on Pattern Recognition (ACPR) 2019**.

Research Experience

- Aug 2024 - Present **Graduate Researcher**, Institute for Creative Technologies, University of Southern California.
— Working on image diffusion models for conditioned image generation and inpainting.
— Working on a Facial Analysis toolkit called LibreFace to make it more robust.
- Apr 2023 - Jul 2024 **Founding Research Engineer**, Anoki Inc..
— Worked with contrastive language-audio models for movie shot retrieval using text and audio.
— Worked with state-of-the-art text-to-speech and voice cloning technologies to generate AI voice-overs for TV advertisements.
— Mentored an intern on emotion recognition in movie scenes using audio and multi-modal approaches, leveraging cues from subtitles and facial expressions.
- Jul 2021 - Mar 2023 **Data Scientist**, LG Ad Solutions (formerly Alphonso Inc.).
— Worked with state-of-the-art speaker verification model RawNet and ECAPA-TDNN to exhibit their generalizability on near-/far-field audios, different languages and under noisy environment.
— Proposed a novel relation network based pipeline for end-to-end speaker recognition.
— Worked on neural fingerprinting for automatic content recognition (ACR) on client TV devices through audio using contrastive learning.
— Worked briefly on voice-based gender and age classification, text-to-speech and neural voice cloning for smart dubbing of video contents.
- May 2020 - Jul 2020 **Research Intern**, Big-data Experience Lab, Adobe Research.
— Used deep Q learning to learn an optimal acquisition function for active learning by modelling the active learning scenario as 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 human feedback from verification and class imbalance in the acquired samples as additional rewards for the MDP and performed ablation studies for them.

- 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 real training dataset, developed a pipeline to generate synthetic dual person dataset and their pose annotations.
 - Also worked on full human body shape prediction to predict the SMPL parameters of a person from single RGB image and performed studies related to camera angles and perspectives.

Projects

- Sep 2020 - Apr 2021 **Improved Sampling for Active Learning**, *Bachelor Thesis Project*, under Prof. R. Balasubramanian, IIT Roorkee.
- Proposed two pipelines for active learning on image classification tasks and demonstrated their effectiveness on MNIST, CIFAR, SVHN and LSUN datasets.
 - First pipeline proposes a sub-linear sampling strategy which leverages the generator of a generative adversarial network (GAN) to find the optimal sample for acquisition.
 - Second pipeline relies on the discriminator score of a GAN to find the optimal sample to be labelled in the current active learning cycle.
- Jan 2020 - Apr 2020 **Survey on Universal Adversarial Perturbations**, [[Paper Link](#)].
- 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.
 - Summarized the extension of universal perturbations to different tasks such as semantic segmentation, depth estimation and image retrieval and discussed future directions in the topic.
- Jan 2020 - Mar 2020 **Vehicle Speed Estimation using Deep Neural Networks**, under Prof. Raksha Sharma, IIT Roorkee.
- Developed a pipeline for vehicular speed estimation using flow-based CNNs.
 - Experimented with the trained neural network to understand the model's sensitivity to certain parts of the input by computing gradients with respect to the inputs.
- Jan 2019 - Apr 2019 **Automatic Evaluation of Machine Synthesized Speech**, [[Paper Link](#)], 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 the evaluation of speech synthesized from *text-to-speech* models.
- [[Paper Link](#)] [[Presentation Link](#)] [[Poster Link](#)]
- Nov 2018 - Feb 2019 **Beginner projects on deep learning**.
- **Variational Autoencoder for MNIST** - Implemented the *Auto-encoding Variational Bayes* paper using PyTorch framework. [[GitHub Link](#)]
 - **One shot learning using Siamese networks** - Implemented the *Siamese Neural Networks for One Shot Image Recognition* paper using PyTorch framework and carried out experiments on the Omniglot dataset. [[GitHub Link](#)]
 - **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

- 2021 Awarded **Institute Bronze Medal** for securing the **third-highest CGPA** among over 1000 graduating students in the **Annual Convocation of IIT Roorkee 2021**.
- 2021 **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.
- 2016 Awarded **KVPY Fellowship** - highly prestigious national fellowship awarded by Indian Institute of Science and Government of India to students who show talent and aptitude in research [[Link](#)].
- 2015 Awarded **NTSE Fellowship** by NCERT under the HRD ministry, Government of India - most prestigious scheme for identifying and nurturing talented students in India [[Link](#)].

Extracurricular Activities

- Apr 2020 - May 2021 **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 - May 2021 **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. **[Link]**
— Responsible for scheduling group activities and managing the administrative front of the group.
- Nov 2020 - May 2021 **Student Mentor**, Student Mentorship Program IIT Roorkee.
— Mentoring freshmen for their smooth transition to campus life, motivating their academic and co-curricular endeavors.

References

Dr. Susmita Ghose, *Head of Data Science*, Anoki. Inc..

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Dr. Lampros Kalampoukas, *ex - Chief Technology Officer*, LG Ad Solutions.

✉ lamprosk@gmail.com

Dr. Sumit Shekhar, *Senior Machine Learning Scientist*, Adobe Research.

✉ sushekha@adobe.com

Dr. Raman Balasubramanian, *Professor*, Indian Institute of Technology Roorkee.

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