Chaitanya Amballa

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PhD Student, ECE · University of Illinois Urbana–Champaign (UIUC)

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Education

University of Illinois Urbana–Champaign — Urbana, IL
Ph.D. in Electrical and Computer Engineering — 2022 – present
Advisor: Prof. Romit Roy Choudhury (SiNRG Lab)
Research: generative modeling, spatial inference, diffusion models for inverse problems

University of Illinois Urbana–Champaign — Urbana, IL
M.S. in Electrical and Computer Engineering — 2022 – 2025
Advisor: Prof. Romit Roy Choudhury

Indian Institute of Technology Tirupati — Tirupati, India
B.Tech. in Electrical Engineering — 2015 – 2019
Advisor: Prof. K. P. Naveen

Honors & Awards

Qualcomm Graduate Award — 2025
INSPIRE Scholarship — 2015
Dept. of Science & Technology, India (top 0.1% in 12th standard exams)
Silver Medals, Intra IIT Table Tennis and Cricket — 2018
IMMO Silver Medal — 2013
NSO & NCO Gold Medals — 2007, 2008
Sai Pratibha Puraskar — 2013

Preprints

[1] **Inferring Indoor Layouts from Walking Trajectories using Diffusion**
Chaitanya Amballa*, Sattwik Basu*, Mrudula Athi, Mohamed Mansour, Mehmet Ergezer, Wontak Kim, Romit Roy Choudhury
(* = equal contribution)

[2] **Learning Energy-based Variational Latent Prior for VAEs**
Debottam Dutta, Chaitanya Amballa, Zhongweiyang Xu, Yu-Lin Wei, Romit Roy Choudhury

[3] **Explicit Context-Driven Neural Acoustic Modeling for High-Fidelity RIR Generation**
Chen Si, Qianyi Wu, Chaitanya Amballa, Romit Roy Choudhury

Publications

[1] **Contrastive Diffusion Guidance for Spatial Inverse Problems** [project page]
Sattwik Basu*, Chaitanya Amballa*, Zhongweiyang Xu, Jorge Vančo Sampedro, Srihari Nelakuditi, Romit Roy Choudhury
(* = equal contribution)
ICLR, 2026

[2] **Inferring Indoor Layouts using Audio**
Zhijian Yang, Sattwik Basu, Chaitanya Amballa, Debottam Dutta, Srihari Nelakuditi, Romit Roy Choudhury
HotMobile, 2026

[3] **Can NeRFs See without Cameras?** [project page]
Chaitanya Amballa, Sattwik Basu, Yu-Lin Wei, Zhijian Yang, Mehmet Ergezer, Romit Roy Choudhury
NeurIPS, 2025

[4] **Identifying Near-Optimal Decisions in Linear-in-Parameter Bandit Models with Continuous Decision Sets**
Sanjay P. Bhat, Chaitanya Amballa
UAI, 2022

[5] **Computing an Efficient Exploration Basis for Learning with Univariate Polynomial Features**
Chaitanya Amballa, Manu K. Gupta, Sanjay P. Bhat
AAAI, 2021

[6] **Coexistence of LTE-Unlicensed and WiFi: A Reinforcement Learning Framework**
K. P. Naveen, Chaitanya Amballa
COMSNETS, 2021

[7] **Learning Algorithms for Dynamic Pricing: A Comparative Study**
Chaitanya Amballa, Narendhar Gugulothu, Manu K. Gupta, Sanjay P. Bhat
ICML Workshop on Real World Experiment Design and Active Learning, 2020

[8] **Coexistence of LTE-Unlicensed and WiFi: Optimization and Game-Theoretic Frameworks**
Chaitanya Amballa, K. P. Naveen
SPCOM, 2020

Research Projects

Human Body Pose Estimation with No Fine-Tuning [project page] Oct 2025 – Dec 2025
Advisor: Dr. Zhizhen Zhao
Diffusion and flow matching for HMD-based pose estimation; posterior sampling for generalization across body shapes

RIR Generation and Geometry Estimation Feb 2025 – May 2025
Advisor: Dr. Minje Kim
RIR generation using diffusion models; optimizing for unknown source position using Alexa measurements

Click2Hear: Spatial Audio Separation using Visual Cues [project page] Aug 2022 – Dec 2022
Advisor: Dr. Saurabh Gupta
Unsupervised source separation; binaural audio from video with mono audio

Co-existence of LTE-Unlicensed and WiFi Aug 2018 – May 2019
Advisor: Dr. K. P. Naveen
Optimization, game-theoretic, and Q-learning frameworks for spectrum coexistence

Speech Enhancement Aug 2018 – Dec 2018
Advisor: Dr. Rama Krishna Sai Gorthi
Convolutional autoencoder networks for real-time speech denoising

Blood Cell Classification and Disease Diagnosis Sep 2017 – Jun 2018
Advisors: Dr. Rama Krishna Sai Gorthi & Dr. Subrahmanyam Gorthi
CNN-based classification of blood cells and disease detection from smear images

Industry Experience

Applied Scientist Intern — May 2025 – Aug 2025
Amazon — Cambridge, MA

Researcher — Jul 2019 – Jul 2022
TCS Research — Hyderabad, India
Sequential decision making, stochastic linear bandits, Thompson sampling, regret analysis under Dr. Sanjay P. Bhat

Project Associate — Jun 2019 – Jul 2019
IIT Tirupati — Tirupati, India

Research Intern — May 2018 – Jul 2018
Lekha Wireless Solutions — Bengaluru, India

Teaching

Teaching Assistant — University of Illinois Urbana–Champaign
ECE 498/598: Deep Generative Models — Spring 2026
Office hours, grading, and student support

Teaching Assistant — University of Illinois Urbana–Champaign
ECE 434: Real-World Algorithms for IoT and Data Science — Spring 2024, Spring 2025
Office hours, grading, and student support

Skills

Generative Modeling: Diffusion Models, NeRFs, Flow Matching, VAEs
Frameworks: PyTorch, TensorFlow, HuggingFace Diffusers/Transformers
Tooling: Slurm, Weights & Biases, Git, Streamlit, LaTeX
Programming: Python, C/C++, MATLAB, SQL

Selected Coursework

ECE 598: Deep Generative Models
ECE 598: Generative Modeling with Diffusion and Flow Matching Models
CS 598: Generative Models for Audio
ECE 549: Computer Vision
ECE 543: Statistical Learning Theory
ECE 586: MDPs and Reinforcement Learning
ECE 534: Random Processes
ECE 490: Introduction to Optimization

Thesis

[1] **M.S. Thesis**
Chaitanya Amballa
M.S. in Electrical and Computer Engineering, UIUC, 2025

[2] **B.Tech. Thesis**
Chaitanya Amballa
B.Tech. in Electrical Engineering, IIT Tirupati, 2019

Leadership

House Captain, Team "Sivaliks" — IIT Tirupati, 2016–2017
Member, Technical Committee — IIT Tirupati, 2017–2019
Electrical Engineering Department Sports Representative — IIT Tirupati, 2017–2018