

# Chaitanya Amballa

MACHINE LEARNING · REINFORCEMENT LEARNING · SEQUENTIAL DECISION MAKING

☎ (+1) 4479021248 | ✉ amballa2@illinois.edu | 🏠 Chaitanya | 📱 achaitu | 🌐 chaitanya-amballa

## Education

---

### University of Illinois at Urbana Champaign (UIUC)

Champaign, Illinois

MS | ELECTRICAL AND COMPUTER ENGINEERING

Aug 2022 –

- Relevant Coursework: Computer Vision, MDPs and reinforcement learning, Random processes, Introduction to optimization

### Indian Institute of Technology Tirupati (IIT Tirupati)

Tirupati, India

BACHELOR OF TECHNOLOGY (B.TECH.) | ELECTRICAL ENGINEERING

Aug 2015 – May 2019

- Relevant Coursework: Pattern Recognition and Machine Learning, Deep Learning for Computer Vision, Image and Video Processing, Data Structures and Algorithms in Python, Design and Analysis of Algorithms, Statistical Signal Processing

## Work Experience

---

### TCS Research

Hyderabad, India

RESEARCHER | ADVISOR: DR. SANJAY P. BHAT

July 2019 – present

- Worked on sequential decision making problems modelled as stochastic linear bandits
- Thompson sampling with Bayesian linear regression
- Characterization and efficient computation of barycentric spanner (see [1])
- Comparison of well-known learning algorithms with our proposed method for dynamic pricing (see [3])
- Regret analysis for the stochastic linear bandits in continuous action space
- Best arm identification for stochastic linear bandits in continuous action space

### IIT Tirupati

Tirupati, India

PROJECT ASSOCIATE | ADVISOR: DR. K. P. NAVEEN

June 2019 – July 2019

- Extended the work on the senior year project “Co-existence of LTE-Unlicensed and WiFi: Optimization, Game Theory, Q-Learning”
- Conducted extensive simulation studies that helped us in proposing [2] and [4]

### Lekha Wireless Solutions Pvt. Ltd.

Bengaluru, India

RESEARCH INTERN | ADVISOR: DR. SREENATH RAMANATH

May 2018 – July 2018

- Worked on the physical layer components of 5G Networks, specifically on the synchronization part at the transmitter and receiver
- Developed a receiver algorithm for the down-link synchronization based on the cyclic prefixes

## Select Publications

---

### [1] Identifying near-optimal decisions in linear-in-parameter bandit models with continuous decision sets

Published

SANJAY P BHAT, CHAITANYA AMBALLA

Aug. 2022

38<sup>th</sup> Conference on Uncertainty in Artificial Intelligence (UAI-22)

### [1] Computing an Efficient Exploration Basis for Learning with Univariate Polynomial Features

Published

CHAITANYA AMBALLA, MANU K GUPTA, SANJAY P BHAT

Feb. 2021

35<sup>th</sup> AAAI Conference on Artificial Intelligence (AAAI-21)

### [2] Coexistence of LTE-Unlicensed and WiFi: A Reinforcement Learning Framework

Published

K. P. NAVEEN, CHAITANYA AMBALLA

Jan. 2021

13<sup>th</sup> International Conference on COMMunication Systems & NETWORKS (COMSNETS 2021)

### [3] Learning Algorithms for Dynamic Pricing: A Comparative Study

Published

CHAITANYA AMBALLA, NARENDHAR GUGULOTHU, MANU K GUPTA, SANJAY P BHAT

July. 2020

Workshop on Real World Experiment Design and Active Learning

37<sup>th</sup> International Conference on Machine Learning (ICML 2020)

## Projects

---

### Speech Enhancement using Deep Learning

Undergraduate Research

ADVISOR: DR. RAMA KRISHNA SAI GORTHI

Aug 2018 – Dec 2018

- Removing various types of noises present in a real time speech signal for better interpretation
- Trained two convolutional autoencoder type networks using the log power spectrum features (with and without using past information)

### Co-existence of LTE-Unlicensed and WiFi: Optimization, Game Theory, Q-Learning

Undergraduate Thesis

ADVISOR: DR. K. P. NAVEEN

Aug 2018 – May 2019

- Determining the optimal number of time slots for LTE transmission in a frame by giving a fair amount of time for WiFi when both LTE and WiFi try to co-exist in an unlicensed spectrum
- Introduced a novel system model, formulated the optimization, game theoretic (see [4]) and Q-learning (see [2]) frameworks to the model and obtained their respective solutions

### Blood Cell Classification and Disease Diagnosis

Undergraduate Research

ADVISORS: DR. RAMA KRISHNA SAI GORTHI & DR. SUBRAHMANYAM GORTHI

Sep 2017 - June 2018

- Counting number of red blood cells, classification of white blood cells into its categories from blood smear images
- Detecting diseases using image processing and machine learning (used convolutional neural networks) techniques

### Smart Hand Stick

Undergraduate Project

ADVISOR: DR. SUBRAHMANYAM GORTHI

July 2016 - Dec 2016

- Improving the quality of life for visually impaired people by providing them a smart hand stick
- Alerts the user about any obstacle present in-front of them by sounding an alarm and vibrating a DC motor

### Covid-19 Tracker

link

- Live Covid-19 cases, recoveries, and deaths using ReactJS and disease.sh APIs for the data
- Cases by country and interactive maps

August. 2020

### React Clones

- LinkedIn (link)
- Instagram (link)
- Netflix (link)

## Skills

---

**Programming Languages** Python, C/C++, Matlab, JavaScript, SQL

**Libraries & Frameworks** Tensorflow, Keras, Scikit, NumPy, SymPy, Git, Flask, React,  $\text{\LaTeX}$ , SQLite, RESTful APIs, Linux, Raspbian, Arduino, Windows, LabView, Adobe Photoshop

**Online Coursework** Data Structures and Algorithms in Python (MOOC NPTEL), Internet Of Things (MOOC NPTEL)

**Languages** English, Telugu, Hindi

## Awards & Achievements

---

1. **Sai Pratibha Puraskar**, Sri Sai Foundation for class X 2013
2. **INSPIRE Scholarship**, Scholarship for undergraduate studies, awarded by the Department of Science and Technology, India for being in the top 0.1 percentile in the 12<sup>th</sup> standard exams 2015
3. **Gold medals**, NSO (National Science Olympiad), NCO (National Cyber Olympiad) 2007, 2008
4. **Silver medal**, IMMO (International Master Mathematics Olympiad) 2013
5. **2<sup>nd</sup> prize**, Intra IIT Table Tennis and Cricket 2018
6. **10<sup>th</sup> prize**, in Inter IIT Tech Meet 2018, for the problem "Safety Device for Fishing Vessels" among all the IITs 2018

## Positions of Responsibility

---

- 1 **House Captain**, team "Sivaliks", IIT Tirupati 2016-2017
- 2 **Member of Technical committee**, IIT Tirupati 2017-2019
- 3 **Department Sports Representative**, Electrical Engineering, IIT Tirupati 2017-2018

## Other Interests

---

Table tennis, Cricket, Photography, Video editing