

## SUBHOJYOTI MUKHERJEE

RISE lab  
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### RESEARCH INTERESTS

**Broad Areas:** Machine learning, Reinforcement learning.

**Working On:** Multi-armed bandits.

### EDUCATION

**Indian Institute of Technology Madras**, Chennai, India    January 2015–present  
*M.S.*, Computer Science & Engineering  
Guides: Dr. Balaraman Ravindran and Dr. Nandan Sudarsanam  
CGPA: 8.40/10

**Meghnad Saha Institute of Technology**, Kolkata, India    2009–2013  
*Bachelor of Technology*, Computer Science & Engineering  
CGPA: 8.42/10

### PUBLICATIONS

1. Subhojyoti Mukherjee, K.P. Naveen, Nandan Sudarsanam, and Balaraman Ravindran, “*Thresholding Bandit with Augmented UCB*”, *Proceedings of the Twenty-Sixth International Joint Conference on Artificial Intelligence (IJCAI-17)*, main conference track.
2. Subhojyoti Mukherjee, K.P. Naveen, Nandan Sudarsanam, and Balaraman Ravindran, “*Efficient UCBV: An Almost Optimal Algorithm using Variance Estimates*”, *To appear in Proceedings of the Thirty-Second Association for the Advancement of Artificial Intelligence (AAAI-18)*, main conference track. Accepted for oral presentation. Awarded Google travel grant and AAAI grant.

### RESEARCH PROJECTS

#### Augmented UCB

Proposed the Augmented-UCB (AugUCB) algorithm for a fixed-budget version of the thresholding bandit problem (TBP), where the objective is to identify a set of arms whose quality is above a threshold. A key feature of AugUCB is that it uses both mean and variance estimates to eliminate arms that have been sufficiently explored. This is the first algorithm to employ such an approach for the considered TBP.

#### Efficient UCB-Variance

Presented a novel algorithm for the stochastic multi-armed bandit (MAB) problem. Our proposed Efficient UCB Variance method, referred to as EUCBV is an arm elimination algorithm based on UCB-Improved and UCBV strategy which takes into account the empirical variance of the arms and along with aggressive exploration factors eliminate sub-optimal arms. Through a theoretical analysis, we establish that EUCBV achieves a better gap-dependent regret upper bound than UCB-Improved, MOSS, UCB1, and UCBV algorithms. EUCBV enjoys an order optimal gap-independent regret bound same as that of OCUCB and MOSS, and better than UCB-Improved, UCB1 and UCBV.

#### Aggregation of Experts

We study a variant of multi-armed bandits where arms are non-stationary but pre-

dictable. The basic idea is to combine change-point detection algorithm with aggregation of expert strategies in order to define efficient pulling strategies in context of bandits with change of distributions. We focus on the guarantees of prediction error for each arm derived from theory, and on the problem of learning adaptively a representation of signal from a practical point of view.

## RESEARCH INTERNSHIP

**INRIA, SequeL Lab:** Research internship under Dr. Odalric Maillard in the INRIA SequeL Lab, Lille, France from 1st September, 2017 to 28th November, 2017 for a period of 3 months.

**Adobe Research, San Jose:** Tentative research internship under Dr. Branislav Kveton in the Adobe Research, San Jose, USA from 22nd January, 2018 to 20th April, 2018 for a period of 3 months.

## Collaborators

- Dr. Balaraman Ravindran, CSE Department, IIT Madras
- Dr. Nandan Sudarsanam, Department of Management Science, IIT Madras
- Dr. K.P. Naveen, Deptment of Electrical Engineering, IIT Tiruapti
- Dr. Odalric-Ambrym Maillard, INRIA, SequeL Lab, Lille, France
- Dr. Branislav Kveton, Adobe Research, San Jose, USA

## TEACHING EXPERIENCE

**Teaching Assistant**, IIT Madras January 2015–present  
Assisted in preparing and conducting lab assignments and class tutorials for the following courses:  
*Introduction to Programming* - Prof. Raghavendra Rao B. V.  
*Reinforcement Learning* - Prof. Balaraman Ravindran  
*Compiler Design* - Prof. Rupesh Nasre

## WORK EXPERIENCE

**Tata Consultancy Services Ltd.**, Kolkata, India March 2014–December 2014  
*Assistant System Engineer Trainee*  
Software development and test engineer in Digital Enterprise Service and Solution.

## PROFESSIONAL ACTIVITIES

**Reviewer** Assisted Dr. Balaraman Ravindran in reviewing for IJCAI 2017.

## RELEVANT COURSEWORK

Introduction to Machine Learning	Reinforcement Learning
Natural Language Processing	Linear Algebra and Random Processes
Multi-variate Data Analysis	Data Analysis for Research
Fundamentals of Experimentation for Management	

## OTHER ACHIEVEMENTS

Scored 314/340 in Graduate Record Examinations (**GRE**) 2017.  
Scored 111/120 in Test of English as a Foreign Language (**TOEFL**) 2017.  
Ranked 1150/155190 candidates in Graduate Aptitude Test in Engineering (**GATE**) 2014.  
Secured 98.93 percentile in Common Admission Test (**CAT**) 2014 among 196988 candidates.

## REFERENCES

### **Dr. Balaraman Ravindran**

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Department of Computer Science & Engg.

Indian Institute of Technology Madras

### **Dr. Nandan Sudarsanam**

Assistant Professor

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### **Dr. K.P. Naveen**

Assistant Professor

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Department of Electrical Engg.

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### **Dr. Odalric Maillard**

INRIA Researcher (CR1)

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SequeL Team

INRIA Lille, France