

KAPILAN BALAGOPALAN

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INTRODUCTION

Skilled and hardworking PhD student, with research experience in recommendation systems, bandit algorithms and reinforcement learning and fine tuning LLMs along with industrial work experience in embedded and hardware programming, looking for summer internships

EDUCATION

University of Arizona, USA

PhD in Computer Science

Current GPA: 3.714/4.0

Aug 2022 - present

University of Moratuwa, Sri Lanka

B.S.(Hons) in Engineering

Department Electronic and Telecommunication Engineering

Overall GPA: 3.81/4.2

Feb 2014 - Jan 2018

Hartley College, Sri Lanka

GCE Advanced Level

Physical Science

Z-score: 2.9004 - National rank - 03

Apr 2010 - Aug 2012

WORK EXPERIENCE

Thales Digital Identity & Security

Embedded Software Engineer

May 2020 - May 2022

Thales DIS, Singapore

Development of Smart card OS for Telco, Secure Element, Transport and Banking applications to be deployed on micro controller chips.

London Stock Exchange Group

Hardware Acceleration Engineer

Feb 2018 - Feb 2020

LSEGTechnology, Sri Lanka

Acceleration of time critical modules in exchange and trading platforms using FPGAs.

RESEARCH EXPERIENCE

University of Arizona

Research Assistant

Aug 2022 - present

University of Arizona, USA

1. Broadly working on advanced linear bandit algorithms and best arm identification for multi armed bandits and fine tuning LLMs using partial monitoring under the supervision of Dr. Kwang-sung Jun.
2. Proposed a new randomized algorithm for linear bandits with closed form probability - LinMED (Minimum Empirical Divergence for Linear Bandits). LinMED have a strong theoretical guarantees and empirical performance comparable to state-of-the-art algorithms and even stronger offline evaluation performance.

3. Worked on designing algorithms for best arm identification which can guarantee an exponentially decaying stopping time.
4. Currently working on formulating active distillation in LLM and speculative decoding in transformers as partial monitoring (PM) games and analyzing the performance of the state-of-the-art PM algorithms in this framework.

Temasek Laboratory, Nanyang Technological University

Research Assistant

Aug 2016 - Dec 2016

NTU, Singapore

1. Implemented improved GEA algorithm based on higher order statistics to separate desired signal in the presence of strong co-channel interference for OQPSK signals.
2. Sequence estimation by applying MMSE equalization on initially separated signal(step 1) and then cancellation of the same signal to estimate the other signal.
3. Combined joint sequence estimation and Iterative Equalization (step 1 and 2)
4. Analyzed the effectiveness of the implemented methodology using recorded real signals.

PUBLICATIONS AND CONFERENCES

1. Minimum Empirical Divergence for Sub-Gaussian Linear Bandits. Kapilan Balagopalan , Kwang-Sung Jun. AISTATS'25: International Conference on Artificial Intelligence and Statistics. 2025.
2. Fixing the Loose Brake: Exponential Tail Bounds for Stopping Time in Best Arm Identification. (co 1st author: †) Kapilan Balagopalan†, Tuan Nguyen†, Yao Zhao†, Kwang-Sung Jun. Under review at ICML (2025)
3. Wang, G., Kapilan, B., Razul, S.G. et al. Blind Equalization in the Presence of Co-channel Interference Based on Higher-Order Statistics. Circuits Syst Signal Process 37, 4150–4161 (2018). doi: 10.1007/s00034-017-0744-x

RELATED COURSEWORKS

Introduction to Machine Learning, Introduction to Computer Vision, Machine Learning Theory, Stochastic processes, Design and Analysis of Algorithms, Advanced Topics in Artificial Intelligence, Probabilistic Graphical Models, Theory of Statistics, Principles of Networking

TECHNICAL SKILLS

Programming Languages	Python, Java, C/C++, Matlab, Octave, Verilog, Javacard, Embedded C, Latex
Application and Tools	FPGAs, Micro-controllers.

AREAS OF INTEREST

Listed in the order of priority

- Bandit Algorithms
- Recommendation systems
- LLMs
- Machine Learning

REFEREES

References available upon request