Anirban Majumdar

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Education

2021- present **PostDoc** at **Université Libre de Bruxelles,** *Belgium*, under **Jean-François Raskin.** .

2018- 2021 **Ph.D.** at **ENS Paris-Saclay,** *France*, under **Patricia Bouyer** and **Nathalie Bertrand** on **Verification and Synthesis of Parameterized Concurrent Systems**.

2016-2018 **M.Sc.** in **Computer Science** from **Chennai Mathematical Institute**, *India*.

2013-2016 **B.Sc.** in **Mathematics and Computer Science** from **Chennai Mathematical Institute**, *India*.

2001-2013 Studied at **Ramakrishna Mission Boys' Home, Rahara**, *India*.
Passed Secondary in 2011 and Higher Secondary in 2013 under West Bengal Board.

Areas Of Interest

My current research focuses mainly on **Automata Learning**. I am also interested in *Reinforcement Learning*, I am currently working on **Markov Decision Processes**. Other areas of interest are *Games on finite graphs*, *Parameterized verification*, etc. During my PhD, I have worked on *Parameterized Verification*.

Theses

Ph.D. thesis **Verification and synthesis of parameterized concurrent systems.** [Pdf]
Supervisors: Patricia Bouyer-Decitre, Nathalie Bertrand.

M.Sc. thesis **Playing with Repetitions in Data Words.** [Pdf]
Supervisor: M. Praveen.

Teaching

2023-2024 *Teaching Assistant*, INFO 410 - Embedded systems design
Teaching Assistant, INFO 412 - Formal verification of computer systems

2022-2023 *Teaching Assistant*, INFO 410 - Embedded systems design
Teaching Assistant, INFO 412 - Formal verification of computer systems

Service

Organizing Local organizer of CONFEST 2023.

Reviewing Subreviewer - *AAMAS 2024*, *ICALP 2020*, *CONCUR 2020*.

Publications [DBLP]

- **Greybox Learning of Languages Recognizable by Event-Recording Automata.** To appear, At *ATVA (2024)*, Sayan Mukherjee, & Jean-François Raskin.
- **Bi-objective Lexicographic Optimization in Markov Decision Processes with Related Objectives.**[Pdf] At *ATVA (2023)*, with Damien Busatto-Gaston, Debraj Chakraborty, Sayan Mukherjee, Guillermo A. Pérez & Jean-François Raskin.
- **Reconfiguration and Message Losses in Parameterized Broadcast Networks.** [Pdf] At *LMCS (2021)*, with Nathalie Bertrand and Patricia Bouyer.
- **Playing with Repetitions in Data Words Using Energy Games.** [Pdf] At *LMCS (2020)*, with Diego Figueira and M Praveen.
- **Synthesizing Safe Coalition Strategies.** [Pdf] At *FSTTCS 2020*, with Nathalie Bertrand and Patricia Bouyer.
- **Computing the Width of Non-deterministic Automata.** [Pdf] At *LMCS (2019)*, with Denis Kuperberg.
- **Concurrent Parameterized Games.** [Pdf] At *FSTTCS 2019*, with Nathalie Bertrand and Patricia Bouyer.
- **Reconfiguration and Message Losses in Parameterized Broadcast Networks.** [Pdf] At *CONCUR 2019*, with Nathalie Bertrand and Patricia Bouyer.
- **Width of Non-deterministic Automata.** [Pdf] At *Stacs 2018*, with Denis Kuperberg.
- **Static and Dynamic Synthesis of Bengali and Devanagari Signatures.** [Web] At *IEEE Transactions on Cybernetics (2018)*, with Moises Diaz, Sukalpa Chanda, Miguel A. Ferrer, Chayan Kr. Banerjee, Cristina Carmona-Duarte, Parikshit Acharya and Umapada Pal.
- **Multiple Generation of Bengali Static Signatures.** [Pdf] At *ICFHR 2016*, with Moises Diaz, Sukalpa Chanda, Miguel A. Ferrer, Chayan Kr. Banerjee, Cristina Carmona-Duarte, Parikshit Acharya and Umapada Pal.

Tools

tLsep - greybox learning of ERA-recognizable languages. [Code]

Events (Workshops/Conferences/Summer Schools)

Oct. 2023	International conference **ATVA**, Singapore.
Sep. 2023	International conference(s) **Confest**, Antwerp, Belgium.
Aug. 2023	Summer school on Reactive Synthesis, Udine, Italy.

Aug. 2023	**Marktoberdorf** Summer School, Germany.
June 2022	**Highlights** conference, Paris, France.
Dec. 2020	International conference **FSTTCS**, online; presented our paper.
June 2020	Summer school **MOVEP**, online.
Dec. 2019	International conference **FSTTCS** at IIT Bombay, India; presented our paper.
Aug. 2019	International conference **CONCUR** at CWI, Amsterdam; presented our paper.
June 2016	Spring school on **Formal Methods and Machine Learning (ForMaL)** at ENS Paris-Saclay, France.
June 2016	Workshop on **Formal Methods and AI (FMAI)** at Inria Rennes, France.
March 2019	Workshop on **Theory and Algorithms in Graph and Stochastic Games** at UMONS, Belgium.
Jan. 2019	**Complexity, Algorithms, Automata and Logic Meet (CAALM)** at CMI, India.
Feb. 2018	International conference **STACS** at Caen, France; presented our paper.
May 2017	International conference **RAMICS** at ENS Lyon, France.
Jan. 2017	Workshop on **Automata, Concurrency and Timed Systems (ACTS)** at CMI, India.
Dec. 2016	International conference **FSTTCS** at CMI, India.
Feb. 2015	Workshop on **Automata, Concurrency and Timed Systems (ACTS)** at CMI, India.

Previous Projects and Internships

January - June 2018	I worked on **Realizability Problem of LRV** under M. Praveen at CMI as my M.Sc. thesis. LRV is a logic to specify properties of data words. We look into the realizability problem of this logic and improve the previous results.
Summer-2017	I worked on **Good For Games Automata** with Denis Kuperberg at **ENS Lyon**, France. We generalized the idea of GFG automata and defined a new notion called *width*, where we allow more than one runs to be built in an online way. We came up with an alternative algorithm for NFA to DFA conversion.
Summer-2016	Reading project on **Bisimulation Equivalence for Pushdown Automata** under Teodor Knapik (Université de la Nouvelle Caledonie) at **IMSC**, Chennai.
Summer-2015	Project in **Pattern Recognition** under Umapada Pal and Miguel Ángel Ferrer Ballester at **ISI**, Kolkata.
Winter-2014	Reading project on **Linear Programming** under Subhas Chandra Nandy at **ISI**, Kolkata.
Summer-2014	Reading Project on **Advanced Graph Algorithms** under Samir Datta at **CMI**, Chennai.

Undergraduate/Graduate studies

Relevant courses

- Theory of Computation, Mathematical Logic, Model Checking and Systems Verification, Logic, Automata and Games, Concurrency Theory, Algebraic Automata Theory.
- Mathematics courses in undergraduate, including Algebra, Analysis, and Topology.

Tools and programming language knowledge

Python, Haskell, Xcos, Matlab, HTML.