Sourya Roy

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Google Scholar

Education

Sept. 2016 – March 2022 **Ph.D. in Computer Science**, *UC Riverside*, GPA: 3.93/4, *Riverside, California*
Advisor: Silas Richelson

August 2011 – May 2015 **B.E. in Instrumentation and Electronics Engineering**, *Jadavpur University*, GPA: 8.48/10, *Kolkata, India*

Experience

Current **Data Scientist**, *Foursquare Inc.*, Los Angeles

2017-2022 **Graduate Student Researcher at UC Riverside**, *UC Riverside*, Riverside

2015-2016 **Visiting Researcher**, *IIT Kharagpur*, India

Summer'21 **Summer Research Intern**, *Intel AI Lab*, San Diego

Summer'20 **Summer Research with Prof. Shachar Lovett**, *UC San Diego*, San Diego

Research Interests

Algorithms, Coding theory, Machine learning

Selected Papers

Almost Ramanujan Expanders from Arbitrary Expanders(Link), *Fernando Granha Jeronimo, Tushant Mittal, Sourya Roy, Avi Wigderson(Alphabetically sorted), FOCS'22*

Mixing of 3-term progressions in Quasirandom Groups(Link), *Amey Bhangale, Prahladh Harsha, Sourya Roy(Alphabetically sorted), ITCS'22*

Learning Spatial-Temporal Graphs for Active Speaker Detection(Link), *Kyle Min†, Sourya Roy†, Subarna Tripathi, Tanaya Guha, Somdeb Majumdar(† : First authors), ECCV 2022.*

List-Decoding XOR Codes Near the Johnson Bound(Link), *Silas Richelson, Sourya Roy(Alphabetically sorted), In submission(2022).*

Analyzing Ta-Shma's Code via the Expander Mixing Lemma(Link), *Silas Richelson, Sourya Roy(Alphabetically sorted), In submission(2022).*

Locally Testable Non-Malleable Codes(Link), *Silas Richelson, Sourya Roy(Alphabetically sorted authors list), In submission.*

Exploiting transitivity for learning person re-identification models on a budget(Link), *Sourya Roy, Sujoy Paul, Neal E. Young, Amit K Roy-Chowdhury, CVPR'18.*

W-TALC: Weakly-supervised Temporal Activity Localization and Classification(Link), *Sujoy Paul, Sourya Roy, Amit K Roy-Chowdhury*, *ECCV'18*.

Applied Projects

2021-2022 **Multi-modal data analysis using graph neural networks(GNN)**
- Built a SOTA GNN model (AVA-2022 2nd place winner) for active speaker detection.

2017-2019 **Data labeling scheme for reducing annotation in Person Re-id**
- Developed a graph based data labeling scheme that minimizes labeled data requirement.
- Analyzed large graphs (3 millions edges) and reduced required annotation by 80-90%.

2017-2018 **Weakly supervised activity localization and classification in videos**
- Collaborated on a project on learning activity localization from weakly labeled videos.
- A novel loss function was introduced that gave SOTA results in multiple datasets.

Theory Projects

2021-2022 **Construction of almost Ramanujan expanders from arbitrary expanders**
- We gave an efficient algorithm that given a family of expanders, constructs a family of near optimal expanders while preserving certain structures.
- Our results give better parameters for other objects (e.g. quantum expanders).

2021-2022 **Decoding of near optimal binary codes at Johnson Bound**
- We designed a polynomial time decoding algorithm for the only known explicit near optimal(rate-distance trade-off) binary code due to Ta-Shma.
- Our decoding algorithm is based on SDP and manages to achieve Johnson bound.

2021 **Mixing of 3-term progressions in Quasirandom Groups**
- We proved a more than a decade old conjecture on 3-term progressions by Gowers.

2019-2020 **Provably secure message encoding scheme with validity testing**
- We proposed a new encoding scheme that allows efficient code-word validity testing.
- Proved security of the encoding algorithm

Technical Skills

Programming **Python, Matlab, CPLEX, Gurobi, C++(basic)**

Deep Learning/ML **Spark, Databricks, Pytorch, Tensorflow, Pytorch-Geometric, OpenCV, Scikit-learn, Kubernetes, SQL, Jupyter**

Teaching Assistant Experience

Fall'17 **Probability and Stochastic Processes**, *Duties: leading discussions, grading*

Winter'18 **Design and analysis of algorithms**, *Duties: leading discussions, grading*

Spring'17,'20 **Combinatorial Optimization**, *Duties: leading discussions, grading*

Winter'21 **Intro to Python Programming**, *Duties: leading lab, grading*

Spring'21 **Intro to Programming with C++**, *Duties: leading lab*

Awards

Dean's distinguished fellowship, *September 2016*, UC Riverside