Kheeran K. Naidu

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A final-year PhD student in the Algorithms and Complexity Theory group at the University of Bristol with a current focus on graph streaming algorithms. Seeking a postdoc in a theory group to tackle research questions pertaining to sublinear algorithms and beyond. Able to quickly adapt to new environments and situations.

EDUCATION

PhD in Computer Science at University of Bristol
Sep 2020 – present
- Studying streaming algorithms and communication lower bounds for graph problems.
- Part of the Algorithms and Complexity Theory group under the supervision of Christian Konrad.

Integrated Master's in Mathematics & Computer Science at University of Bristol
Sep 2016 – Jun 2020
- Master's Thesis on Probabilistic Machine Learning under the supervision of Carl Henrik Ek.
- Bachelor's Thesis on Group Theory under the supervision of Francesco Mezzadri.

EXPERIENCE

Lead Teaching Assistant at University of Bristol
Sep 2018 – Aug 2023
- Delivered lectures to a cohort of 200+ students, managed 10+ teaching assistants, and prepared and marked final exams.
- Modules included Advanced Algorithms, Advanced Topics in Theoretical Computer Science, and more.

Director & Chief Developer at The Pangean
Oct 2018 – present
- Founded, created and managed an online magazine (https://thepangean.com/) that has published 500+ articles and received 4000+ visitors per month on average in 2023.

Head of Technology at Ma-Kasih
Jul 2021 – Nov 2021
- Led a tech team of volunteer professional developers over two months to re-develop a non-profit online platform (https://makasih.care/) that supported struggling communities during the pandemic.
- The platform reached 3000+ people.

Consultant at Qworky
Dec 2019 – Jul 2022
- Implemented a probabilistic machine learning model for the proof of concept of a platform that encourages the safer consumption of information for children.
- Improved clients' awareness of AI and technology through a series of seminars and infographics.

PUBLICATIONS

O(loglog n) Passes is Optimal for Semi-Streaming Maximal Independent Set
STOC 2024 *(with S. Assadi, C. Konrad, J. Sundaresan)*
- Proved one of the first optimal multi-pass lower bounds in the graph streaming model.

An Unconditional Lower Bound for Two-Pass Streaming Algorithms for Maximum Matching Approximation
SODA 2024 *(with C. Konrad)*
- Proved the first unconditional lower bound for two-pass approximate maximum matching.

Maximum Matching via Maximal Matching Queries
STACS 2023 *(with C. Konrad, A. Steward)*
- Designed a greedy-only three-pass semi-streaming algorithm for approximate maximum matching.

Improved Weighted Matching in the Sliding Window Model
STACS 2023 *(with C. Alexandru, P. Dvořák, C. Konrad)*
- Closed the gap between weighted and unweighted maximum matching in sliding window streams.

Space Optimal Vertex Cover in Dynamic Streams
APPROX 2022 *(with V. Shah, a student-only paper)*
- Designed an optimal algorithm for minimum vertex cover in streams with deletions.

On Two-Pass Streaming Algorithms for Maximum Bipartite Matching
APPROX 2021 *(with C. Konrad)*
- Proved a (conditional) lower bound for two-pass approximate maximum matching.

FUNDING

EPSRC Doctoral Training Partnership Award
Sep 2020 – Mar 2024 *(full PhD funding)*

SIAM Travel Award for SODA24
Jan 2024

SIAM Travel Award for SODA21 (virtual)
Jan 2021

Astro Scholarship Award
Jul 2016 – Jun 2020 *(full Integrated Master's funding)*

Barry Thomas Scholarship in Computer Science
Sep 2016 *(one-off payment for outstanding overseas students)*

More details at https://kheerannaidu.com/. References available upon request.