Seungbum Jo

Assistant Professor
Division of Computer Convergence
Chungnam National University

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Research Interests

- Algorithms and Data structures: Space-efficient data structures and algorithms, sorting and selection problems, etc.
- Algorithm Engineering

Education

Ph.D in Computer Science and Engineering 2011.03 – 2016.02
Seoul National University (Advisor : Srinivasa Rao Satti)
Thesis : Space Efficient Encodings for Bit-strings, Range Queries and Related Problems

MS in Computer Science 2009.03 – 2011.02
KAIST (Advisor : Kyung-Yong Chwa)
Thesis : Iterated local search for vertex coloring (In Korean)

BS in Computer Science and Mathematical Science 2005.03 – 2009.02
KAIST

Work experience

Assistant Professor 2021.09 – current
Chungnam National University

Assistant Professor 2019.09 – 2021.08
Chungbuk National University

Postdoctoral Researcher 2019.04 – 2019.08
Université libre de Bruxelles (Advisor : John Iacono)

Postdoctoral Researcher 2016.04 – 2019.03
University of Siegen (Advisor : Markus Lohrey)

Visiting Postdoctoral Researcher 2018.01 – 2018.06
University of Haifa (Advisor : Shay Mozes and Oren Weimann)

Internship 2007.06 – 2007.08
Electronics and Telecommunications Research Institute (ETRI), Rendering Team

Publications (Peer-reviewd)

Practical implementations of Compressed RAM
(with Wooyong Park, Kunihiko Sadakane and Srinivasa Rao Satti)
In DCC 2023 (to appear)

Energy Efficient Sorting, Selection and Searching
(with Varunkumar Jayapaul, Krishna V. Palem and Srinivasa Rao Satti)
In WALCOM 2023 (to appear)

Space-efficient data structure for next/previous larger/smaller value queries
(with Geunho Kim)
In LATIN 2022

Compact Representation of Interval Graphs of Bounded Degree and Chromatic Number
(with Sankardeep Chakraborty)
In DCC 2022
In Theoretical Computer Science, 2023

Succinct Data Structures for Series-Parallel, Block-Cactus and 3-Leaf Power Graphs
(with Sankardeep Chakraborty, Kunihiko Sadakane and Srinivasa Rao Satti)
In COCOA 2021

Practical Implementation of Encoding Range Top-2 Queries
(with Wooyong Park and Srinivasa Rao Satti)
In SEA 2021
In The Computer Journal (to appear)

Succinct Data Structures for Small Clique-Width Graphs
(with Sankardeep Chakraborty, Kunihiko Sadakane and Srinivasa Rao Satti)
In DCC 2021

Succinct representations of Intersection Graphs on a Circle
(with Hüseyin Acan, Sankardeep Chakraborty, Kei Nakashima, Kunihiko Sadakane and Srinivasa Rao Satti)
In DCC 2021
In Theoretical Computer Science, 2022

Succinct Encodings for Families of Interval Graphs
(with Hüseyin Acan, Sankardeep Chakraborty and Srinivasa Rao Satti)
In WADS 2019 - ***Alejandro López-Ortiz Best Paper Award***
In Algorithmica, 2021 (special issue)

Combined compression of multiple correlated data streams for online-diagnosis systems.
Simon Meckel, Markus Lohrey, Seungbum Jo, Roman Obermaisser and Simon Plasger
In DSD 2019
In Microprocessors and Microsystems, 2020 (special issue)

Approximate Query Processing over Static Sets and Sliding Windows
(with Ran Ben Basat, Srinivasa Rao Satti and Shubham Ugare)
In ISAAC 2018
In Theoretical Computer Science, 2021

Encoding two-dimensional range top-k queries revisited
(with Srinivasa Rao Satti)
In ISAAC 2018
In Algorithmica, 2021 (combined with CPM 2016 paper)

Compressed Range Minimum Queries
(with Pawel Gawrychowski, Shay Mozes and Oren Weimann)
In SPIRE 2018
In Theoretical Computer Science, 2020

An Architecture for Online-Diagnosis Systems supporting Compressed Communication
(with Markus Lohrey, Damian Ludwig, Simon Meckel, Roman Obermaisser and Simon Plasger)
In DSD 2017
In Microprocessors and Microsystems, 2018 (special issue)

Compressed Bit vectors Based on Variable-to-Fixed Encodings
(with Stelios Joannou, Daisuke Okanohara, Rajeev Raman and Srinivasa Rao Satti)
In The Computer Journal, 2017

Encoding Two-Dimensional Range Top-k Queries
(with Rahul Lingala and Srinivasa Rao Satti)
In CPM 2016

Simultaneous Encodings for Range and Next/Previous Larger/Smaller Value Queries
(with Srinivasa Rao Satti)
In COCOON 2015
In Theoretical Computer Science, 2016 (special issue)

Compact Encodings and Indexes for the Nearest Larger Neighbor Problem
(with Rajeev Raman and Srinivasa Rao Satti)
In WALCOM 2015
In Journal of Discrete Algorithms, 2016 (special issue, combined with IWOCA 2014 paper)

Space Efficient Data Structures for Nearest Larger Neighbor
(with Varunkumar Jayapaul, Venkatesh Raman and Srinivasa Rao Satti)
In IWOCA 2014

Theory and Implementation of Online Multiselection Algorithms
(with Jérémy Barbay, Ankur Gupta, Srinivasa Rao Satti and Jonathan P. Sorenson)
In ESA 2013

Analysis and Comparison of Tree Indexing Structures in Flash Memory Models
(with Vineet Pandey and Srinivasa Rao Satti)
In Journal of KIISE, 2011

Other Talks and Posters

Encoding two-dimensional range top-k queries revisited
(with Srinivasa Rao Satti)
WCTA 2018

Approximate Query Processing over Static Sets and Sliding Windows
(with Ran Ben Basat, Srinivasa Rao Satti and Shubham Ugare)
WAAC 2018

Compressed Bit Vectors Based on Variable-to-Fixed Encodings
(with Srinivasa Rao Satti)
WAAC 2018

Improved Space-efficient Linear Time Algorithms for Some Classical Graph Problems
(with Sankardeep Chakraborty, Srinivasa Rao Satti)
CTW 2017

Compressed Bit Vectors Based on Variable-to-Fixed Encodings
(with Stelios Joannou, Daisuke Okanohara, Rajeev Raman and Srinivasa Rao Satti)
WAAC 2014

Compressed Bit Vectors Based on Variable-to-Fixed Encodings
(with Stelios Joannou, Daisuke Okanohara, Rajeev Raman and Srinivasa Rao Satti)
DCC 2014 poster

Research Grants (as principal investigator)

Design and implementation of data structures for various queries on Graphs with bounded width parameters
Granted by National Research Foundation of Korea (NRF) *2020.09 – 2023.08*

Design of Space-Efficient data structures for various graph classes
Granted by Chungbuk National University *2019.09 – 2021.02*

Teaching Experience

Teaching: Algorithms, Data structures, Basic Python, Linear Algebra, Discrete mathematics, Probability and Statistics

Teaching Assistant (at KAIST and SNU): Problem Solving, Data Structures,Computer Programming

Personal Service

PC member: ISAAC 2022

Reviewer: Algorithmica, Information and Computation, Theoretical Computer Science, Theory of Computing Systems, The Computer Journal, IEEE Access

Subreviewer: CPM, FCT, ISAAC, MFCS, SPIRE, WADS

Others ACM-ICPC Korea Site Judge (2020-2022), ACM-ICPC Korea Site staff (2009 - 2011)

Students

Geunho Kim: Undergraduate intern (2021.01 - 2022.12)

Reference

Prof. Srinivasa Rao Satti: Associate professor / Norwegian University of Science and Technolgy / srinivasa.r.satti@ntnu.no

Prof. Markus Lohrey: Professor / University of Siegen / lohrey@eti.uni-siegen.de

Prof. Kunihiko Sadakane: Professor / The University of Tokyo / sada@mist.i.u-tokyo.ac.jp

Prof. Oren Weimann: Associate professor / University of Haifa / oren@cs.haifa.ac.il