

# Seungbum Jo

Assistant Professor

Division of Computer Convergence

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## Research Interests

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

## Education

<b>Ph.D in Computer Science and Engineering</b>	2011.03 – 2016.02
Seoul National University (Advisor : Srinivasa Rao Satti)	
<i>Thesis : Space Efficient Encodings for Bit-strings, Range Queries and Related Problems</i>	
<b>MS in Computer Science</b>	2009.03 – 2011.02
KAIST (Advisor : Kyung-Yong Chwa)	
<i>Thesis : Iterated local search for vertex coloring (In Korean)</i>	
<b>BS in Computer Science and Mathematical Science</b>	2005.03 – 2009.02
KAIST	

## Work experience

<b>Assistant Professor</b>	2021.09 – current
Chungnam National University	
<b>Assistant Professor</b>	2019.09 – 2021.08
Chungbuk National University	
<b>Postdoctoral Researcher</b>	2019.04 – 2019.08
Université libre de Bruxelles (Advisor : John Iacono)	
<b>Postdoctoral Researcher</b>	2016.04 – 2019.03
University of Siegen (Advisor : Markus Lohrey)	
<b>Visiting Postdoctoral Researcher</b>	2018.01 – 2018.06
University of Haifa (Advisor : Shay Mozes and Oren Weimann)	
<b>Internship</b>	2007.06 – 2007.08
Electronics and Telecommunications Research Institute (ETRI), Rendering Team	

## Publications (Peer-reviewed)

### 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**

### **Succinct Encodings for Families of Interval Graphs**

*(with Hüseyin Acan, Sankardeep Chakraborty and Srinivasa Rao Satti)*

*CTW 2019*

### **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*

### **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 Technology / [srinivasa.r.satti@ntnu.no](mailto:srinivasa.r.satti@ntnu.no)

**Prof. Markus Lohrey:** Professor / University of Siegen / [lohrey@eti.uni-siegen.de](mailto:lohrey@eti.uni-siegen.de)

**Prof. Kunihiko Sadakane:** Professor / The University of Tokyo / [sada@mist.i.u-tokyo.ac.jp](mailto:sada@mist.i.u-tokyo.ac.jp)

**Prof. Oren Weimann:** Associate professor / University of Haifa / [oren@cs.haifa.ac.il](mailto:oren@cs.haifa.ac.il)