

## Ioana Oriana Bercea

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### Positions

- 1/10/2023–  
present **Assistant Professor (tenure-track),**  
DIVISION OF THEORETICAL COMPUTER SCIENCE  
Department of Computer Science, School of Electrical Engineering and Computer Science  
KTH ROYAL INSTITUTE OF TECHNOLOGY, Stockholm, Sweden
- 1/05/2021–  
30/09/2023 **Postdoc,**  
BASIC ALGORITHMS RESEARCH COPENHAGEN (BARC)  
Department of Computer Science  
IT UNIVERSITY OF COPENHAGEN, Copenhagen, Denmark  
Host: Thore Husfeldt
- 1/09/2018–  
30/04/2021 **Postdoc,**  
School of Electrical Engineering  
TEL AVIV UNIVERSITY, Tel Aviv, Israel  
Host: Guy Even

### Education

- 03/09/2013–  
17/08/2018 **Ph.D. in Computer Science,**  
UNIVERSITY OF MARYLAND, College Park, MD, USA  
Thesis: *Approximation Algorithms for Geometric Clustering and Touring Problems*  
Advisor: Samir Khuller
- 30/08/2010–  
19/05/2013 **M.Sc. in Computer Science,**  
UNIVERSITY OF MARYLAND, College Park, MD, USA  
Advisor: Aravind Srinivasan
- 25/09/2006–  
12/06/2010 **B.Sc. in Mathematics (Honors) and B.Sc. in Computer Science,**  
UNIVERSITY OF CHICAGO, Chicago, IL, USA  
Four-year scholarship for tuition, housing and stipend (unconditioned on GPA)

### Honors and Awards

- 2025 **Best Research Paper Award, VLDB**
- 2023 **Best Artifact Award, ACM SIGMOD**
- 2023 **Future Digileader, DIGITAL FUTURES**
- 2014–2015 **Outstanding Graduate Assistant Award, UNIVERSITY OF MARYLAND**  
Top 2% of all UMD Graduate Assistants
- 2010–2012 **Dean's Fellowship, UNIVERSITY OF MARYLAND**
- 2006–2008, 2009–2010 **Dean's List, UNIVERSITY OF CHICAGO**

### Grants

- 2025 – 2028 **Starting Grant, SWEDISH RESEARCH COUNCIL**  
Natural and engineering sciences, 1 100 000 SEK/year

## Refereed Conference Articles (Author Order Alphabetical)

- VLDB'25 **Diva: Dynamic Range Filter for Var-Length Keys and Queries**  
Navid Eslami, Ioana O. Bercea, Niv Dayan (*authors in order of contribution*)  
In: *Very Large Data Bases Conference*, (VLDB)  
*Awarded Best Research Paper of VLDB 2025*
- ICALP'25 **Algorithms for the Diverse-k-SAT problem: the geometry of satisfying assignments**  
Per Austrin, Ioana O. Bercea, Mayank Goswami, Nutan Limaye, and Adarsh Srinivasan  
In: *EATCS International Colloquium on Automata, Languages, and Programming*, (ICALP)
- CIAC'25 **Dynamic Filter and Retrieval with One Access to Modifiable Memory**  
Ioana O. Bercea, Guy Even, Tomer Even and Gabriel Marques Domingues  
In: *International Conference on Algorithms and Complexity*, (CIAC)
- ESA'24 **Online sorting and online TSP: randomized, stochastic, and high-dimensional**  
Mikkel Abrahamsen, Ioana O. Bercea, Lorenzo Beretta, Jonas Klausen, László Kozma  
In: *European Symposium on Algorithms*, (ESA)
- VLDB'24 **Aleph Filter: To Infinity in Constant Time**  
Niv Dayan, Ioana O. Bercea, Rasmus Pagh (*authors in order of contribution*) (*authors in order of contribution*)  
In: *Very Large Data Bases Conference*, (VLDB)
- SWAT'24 **Daisy Bloom Filters**  
Ioana O. Bercea, Jakob Bæk Tejs Houen, Rasmus Pagh  
In: *19th Scandinavian Symposium and Workshops on Algorithm Theory*, (SWAT)
- FOCS'23 **Locally Uniform Hashing**  
Ioana O. Bercea, Lorenzo Beretta, Jonas Klausen, Jakob Bæk Tejs Houen, Mikkel Thorup  
In: *64th IEEE Symposium on Foundations of Computer Science*, (FOCS)
- SIGMOD'23 **InfiniFilter: Expanding Filters to Infinity and Beyond**  
Niv Dayan, Ioana O. Bercea, Pedro Reviriego, Rasmus Pagh (*authors in order of contribution*)  
In: *International Conference on Management of Data*, (SIGMOD)  
*Awarded Best Artifact of ACM SIGMOD 2023*
- STOC'22 **An Extendable Data Structure for Incremental Stable Perfect Hashing**  
Ioana O. Bercea, Guy Even  
In: *54th Annual ACM Symposium on Theory of Computing*, (STOC)
- WADS'21 **Dynamic Dictionaries for Multisets and Counting Filters with Constant Time Operations**  
Ioana O. Bercea, Guy Even  
In: *17th Algorithms and Data Structures Symposium*, (WADS)  
*Invited to the special issue of Algorithmica*
- CIAC'21 **Upper Tail Analysis of Bucket Sort and Random Tries**  
Ioana O. Bercea, Guy Even  
In: *12th International Conference on Algorithms and Complexity*, (CIAC)  
*Invited to the special issue of Theoretical Computer Science*
- SWAT'20 **A Dynamic Space-Efficient Filter with Constant Time Operations**  
Ioana O. Bercea, Guy Even  
In: *17th Scandinavian Symposium and Workshops on Algorithm Theory*, (SWAT), pp. 11:1-11:17
- APPROX'19 **On the cost of essentially fair clusterings**  
Ioana O. Bercea, Martin Groß, Samir Khuller, Aounon Kumar, Clemens Rösner, Daniel R. Schmidt, Melanie Schmidt  
In: *22nd International Workshop on Approximation Algorithms for Combinatorial Optimization Problems*, (APPROX), pp. 18:1-18:22

- CCCG'18 **Improved Bounds for the Traveling Salesman Problem with Neighborhoods on Uniform Disks**  
Ioana O. Bercea  
In: *30th Canadian Conference on Computational Geometry, (CCCG)*, pp.129-141
- CCCG'16 **Minimizing Uncertainty through Sensor Placement with Angle Constraints**  
Ioana O. Bercea, Volkan Isler, Samir Khuller  
In: *28th Canadian Conference on Computational Geometry, (CCCG)*, pp. 287-294
- SPAA'14 **On Computing Maximal Independent Sets of Hypergraphs in Parallel**  
Ioana O. Bercea, Navin Goyal, David G. Harris, Aravind Srinivasan  
In: *26th ACM Symposium on Parallelism in Algorithms and Architectures, (SPAA)*, pp. 42-50  
[Invited to the special issue of TOPC](#)

## Journal Articles

- 2022 **Dynamic Dictionaries for Multisets and Counting Filters with Constant Time Operations**  
Ioana O. Bercea, Guy Even  
In: *Algorithmica*, Special issue on WADS 2021
- 2021 **Upper Tail Analysis of Bucket Sort and Random Tries**  
Ioana O. Bercea, Guy Even  
In: *Theoretical Computer Science*, Special issue on CIAC 2021
- 2016 **On Computing Maximal Independent Sets of Hypergraphs in Parallel**  
Ioana O. Bercea, Navin Goyal, David G. Harris, Aravind Srinivasan  
In: *ACM Transactions on Parallel Computing*, Special issue on SPAA 2014

## Invited Workshops

- Feb. 2026 NII SHONAN: *New Era of Data Structures: From Strings to Graphs, and more*
- Aug. 2025 DAGSTUHL : *Software Performance Engineering*
- May 2025 DAGSTUHL : *Adaptive and Scalable Data Structures*
- May 2025 DAGSTUHL : *Learned Predictions for Data Structures and Running Time*
- March 2025 NII SHONAN: *Algorithmic tools and their applications in emerging models of computation*
- July 2024 NU SINGAPORE: *Algorithms and Data Structures Today*
- Sept 2023 BERTINORO : *Algorithmic Aspects of Clustering and Related Problems*
- May 2023 DAGSTUHL : *Scalable Data Structures*
- March 2023 NII SHONAN : *New Frontiers in Locality in Computation*
- Feb. 2021 DAGSTUHL : *Scalable Data Structures*
- Oct. 2019 IGAFIT: *Workshop for Postdoctoral Researchers in Algorithms*
- Sept. 2019 GI-DAGSTUHL : *Algorithms for Big Data*
- March 2019 DAGSTUHL : *Theoretical Foundations of Storage Systems*
- Jan. 2019 DAGSTUHL: *Data Structures for the Cloud and External Memory Data*
- Oct. 2018 7th French-Israeli Workshop on Foundations of Computer Science

## Invited Talks

- Dec 2025 A CELEBRATION OF TCS, Sydney, Australia
- Oct 2025 WAVE (WOMEN IN ALGORITHMS, VENTURE INTO EXPLORATION), Copenhagen, Denmark
- June 2025 BOCCONI THEORY DAY, Milan, Italy
- Dec 2024 AUSTRALASIAN SUMMER SCHOOL ON RECENT TRENDS IN ALGORITHMS, Sydney, Australia
- July 2023 ROMANIAN ALGORITHMS DAYS, virtual

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## Supervision

- 2021-2025 **Jonas Østergaard Klausen**  
PhD, UNIVERSITY OF COPENHAGEN  
co-supervised with Mikkel Thorup, Jacob Holm  
→ postdoc at MPI Saarbrücken
- 2025 **Lisa Schmierer**  
Master's thesis, TECHNICAL UNIVERSITY OF MUNICH (TUM)
- 2025 **Rani Eydfinnsson Ì Bø**  
Master's thesis, TECHNICAL UNIVERSITY OF DENMARK (DTU)  
co-supervised with Eva Rotenberg
- Summer 2024, 2025 **Max Harrison, Brandy Rydberg Paltser, Eira Larsson**  
Digital Futures Internship, KTH
- Spring 2023 **Jens Birk Andersen, Malthé Mathias Mølgaard Larsen**  
BSc Thesis, IT UNIVERSITY OF COPENHAGEN  
co-supervised with Martin Aumüller

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## Teaching

- Fall 2023 – **Course Responsible, Teacher for DD2440 Advanced Algorithms, MsC,**  
KTH ROYAL INSTITUTE OF TECHNOLOGY, Department of Computer Science
- Summer 2022 **Co-Instructor for Algorithms and Data Structures BSc, MSc,**  
& 2023 IT UNIVERSITY OF COPENHAGEN, Department of Computer Science
- Spring 2016 **Co-Instructor for CMSC 122: Intro to Computer Programming via the Web,**  
UNIVERSITY OF MARYLAND, Department of Computer Science
- 2010–2018 **Graduate Teaching Assistant,**  
UNIVERSITY OF MARYLAND, Department of Computer Science  
D = Leading discussion sections, presenting new material, reviewing, quizzes, grading, office hours; G = Grading and office hours
- CMSC 250: Discrete Structures,**  
Fall 2011(D), Spring 2014(D), Spring 2015(D), Fall 2015(D), Fall 2016(D), Spring 2017(G)
- CMSC 131/132: Object Oriented Programming I, II,**  
Fall 2010 (D), Fall 2013(D), Spring 2018(G)
- CMSC 216: Introduction to Computer Systems,**  
Spring 2011(G), Summer 2011(D)
- CMSC 351: Introduction to Algorithms,**  
Spring 2012(G)
- CMSC 122: Intro to Computer Programming via the Web,**  
Fall 2017(G)
- 2009–2010 **Junior Tutor for Elementary Functions and Analysis 1,2,3,**  
UNIVERSITY OF CHICAGO, Mathematics Department

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## Service

- 2024 – **Co-editor** ALGORITHMS COLUMN FOR THE BULLETIN OF EATCS (*with Thomas Erlebach*)
- 2025 – 26 **Local chair** HIGHLIGHTS OF ALGORITHMS (*HALG 2026*)
- 2024 – 25 **Guest journal editor** THEORY OF COMPUTING (*Special issue on RANDOM 2024*)
- 2025 **Program Committee co-chair** SOSA 2025 (*with Rasmus Pagh*)
- Program Committee member** COCOON 2026, SWAT 2026, ICALP 2026, STACS 2026, SODA 2026, ESA 2025, RANDOM 2024, ISAAC 2024, SOSA 2024, ICDCN 2020

### Conference Reviewer

- 2025 FOCS, IPCO
- 2024 FOCS, STOC, SODA, ICALP, ITCS, SWAT, SPAA, ESA, MFCS, SOFSEM
- 2023 FOCS, SODA, ICALP, ISAAC, FCT, SOSA, ALENEX
- 2022 FOCS, STOC, APPROX
- 2020 – 21 WAOA'21, ESA'21, SPAA'21, WADS'21, SODA'20, STACS'20
- < 2020 ICALP '24, SWAT'24, SPAA'24, STOC'24, ITCS'24, SODA'24

**Journal Reviewer** *SIAM Journal on Computing, TheoretCS, Journal of Computer Science and Technology, Transactions on Computers, European Journal of Operational Research, Theoretical Computer Science, Networks, ACM Transactions on Sensor Networks, The Visual Computer*

- 2015–2016 **Graduate Student Representative,**  
UNIVERSITY OF MARYLAND, Computer Science Department Council
- 2012–2014 **Graduate Student Representative,**  
UNIVERSITY OF MARYLAND, Computer Science Department Education Committee

### Talks

#### Locally Uniform Hashing

- Sept. 2025 UPPSALA UNIVERSITY: *Probabilities and Statistics seminar*
- Aug. 2025 TU WIEN
- June 2025 BOCCONI THEORY DAY
- May 2022 ALGORITHMIC RESEARCH COOPERATION AROUND ØRESUND (ARCO)
- March 2025 NII TOKYO
- March 2025 TOKYO TECH
- July 2025 NU SINGAPORE: *Algorithms and Data Structures Today*
- July 2023 ROMANIAN ALGORITHMS DAYS

#### Locality in Data Structures

- May 2023 AARHUS UNIVERSITY, *Algorithms and Complexity Theory Seminar*
- March 2023 NII SHONAN MEETING: *New Frontiers in Locality in Computation*

#### Daisy Bloom Filters

- June 2024 SWAT
- Nov. 2022 ALGORITHMIC RESEARCH COOPERATION AROUND ØRESUND (ARCO)

#### An Extendable Data Structure for Incremental Stable Perfect Hashing

- Oct. 2025 WAVE (WOMEN IN ALGORITHMS, VENTURE INTO EXPLORATION)
- May 2023 DAGSTUHL SEMINAR: *Scalable Data Structures*
- July 2022 STOC
- June 2022 HIGHLIGHTS OF ALGORITHMS (HALG) (short)

#### Dictionaries et al.

- Sept. 2021 DIGITAL RESEARCH CENTER DENMARK (DIREC)
- May 2021 BARC, *Seminar*
- March 2021 BAR-ILAN UNIVERSITY, *Computer Science Department Colloquium*
- Feb. 2021 DAGSTUHL SEMINAR: *Scalable Data Structures*

#### Upper Tail Analysis of Bucket Sort and Random Tries

- June 2020 20TH HAIFA WORKSHOP ON GRAPH THEORY, COMBINATORICS AND ALGORITHMS

### **Dynamic Dictionaries for Multisets and Counting Filters with Constant Time Operations**

Aug. 2021 WADS

### **A Dynamic Space-Efficient Filter with Constant Time Operations**

June 2020 SWAT

Dec. 2019 UTRECHT UNIVERSITY, Algorithms Seminar

Sept. 2019 GI-DAGSTUHL SEMINAR: Algorithms for Big Data

July 2019 WORKSHOP ON LOCAL ALGORITHMS (WOLA)

### **The Descent of Cuckoos, and Selection in Relation to Nests**

June 2019 HIGHLIGHTS OF ALGORITHMS (HALG) (short)

June 2019 19TH HAIFA WORKSHOP ON GRAPH THEORY, COMBINATORICS AND ALGORITHMS

May 2019 ISRAELI NETWORKING DAY

March 2019 MAX PLANCK INSTITUTE FOR INFORMATICS, Theory Seminar

Jan. 2019 DAGSTUHL SEMINAR: *Data Structures for the Cloud and External Memory Data*

### **Improved Bounds for the Traveling Salesman Problem with Neighborhoods on Uniform Disks**

Nov. 2018 TEL AVIV UNIVERSITY, Computational Geometry Seminar

Oct. 2018 *7th French-Israeli Workshop on Foundations of Computer Science*

Aug. 2018 CCCG

April 2018 CENTRA DE RECERCA MATEMATICA, IRP Program

### **Minimizing Uncertainty through Sensor Placement with Angle Constraints**

Aug. 2016 CCCG

### **On Computing Maximal Independent Sets of Hypergraphs in Parallel**

June 2014 SPAA