

Curriculum Vitae: Arnold Filtser

Basic information

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Positions

2019-now : PostDoc in the Computer Science Department, Columbia University.
Part of the Algorithms and Geometry Collaboration - Simons Foundation.
Hosts: Alex Andoni and Rocco Servedio.

Education

2014-2019 : PhD student in Computer Science, Ben-Gurion University.
Advisors: Robert Krauthgamer and Ofer Neiman.
Title: On Refined Notions of Embeddings.
Committee: Yair Bartal, Eden Chlamtáč, and Michael Elkin.

2012-2014 : MSc in Computer Science, Ben-Gurion University.
Advisors: Michael Elkin and Ofer Neiman.
Title: Terminal Embeddings.
Graduated Summa cum Laude. (MSc final- **98.56/100**).
Ranking: **1st** out of 19 Master's graduated in the department.

2009-2012 : BSc in Mathematics and Computer Science, Ben-Gurion University.
Graduated Summa cum Laude. GPA: **98.2/100**.
Ranking: Math: **1st** out of 45 in the department.
Computer Science: **2nd** out of 178 in the department.

Honors and Awards:

During PHD:

- Rectors's honor for excellent PhD students 2019 (top 0.4%, BGU highest award).
- Best Student Paper Award- for the paper "The Greedy Spanner is Existentially Optimal" (co-authored with Shay Solomon) in PODC 2016.
- Nomination for the best paper award for the paper "Distributed Monitoring of Election Winners" (co-authored with Nimrod Talmon) in AAMAS 2017 (see [here](#)).
- Levzion Scholarship: Israeli Ministry of Science & Technology Scholarship for excellent PhD students from the periphery 2016-2019. The scholarship given to up to 10 students annually (in all fields).
- Dean's honor for excellent PhD students 2016.
- Friedman Award for outstanding achievements in research 2016,2018.
- Negev Scholarship for excellence in research, 2014-2018.

During Bachelor's:

- Rector's honor for excellent students 2013 (top 0.2%, BGU highest award).
- Dean's honor for excellent undergraduate students 2012 (top 0.6%).
- Rector's honor for excellent students 2011 (top 0.2%, BGU highest award).
- BGU Computer science department honors 2011,2012.
- BGU Math department honors 2012.
- Intel Award, 2012.
- Microsoft scholarship program for undergraduate students, 2011, 2012 Award.
- Martha and Solomon Scharf prize for excellent undergraduate, 2010, 2011, 2012.
- "Dkalim" program.

Journal Publications:

- **Arnold Filtser**, Shay Solomon:
The Greedy Spanner is Existentially Optimal.
To appear: SIAM Journal on Computing (**SICOMP 2020**).
- Ittai Abraham, Shiri Chechik, Michael Elkin, **Arnold Filtser**, Ofer Neiman:
Ramsey Spanning Trees and their Applications.
To appear: Transactions on Algorithms (**TALG 2020**).
- **Arnold Filtser**, Nimrod Talmon:
Distributed Monitoring of Election Winners.
Artificial Intelligence Journal (**AIJ 2019**).
- Yair Bartal, **Arnold Filtser**, Ofer Neiman:
On Notions of Distortion and an Almost Minimum Spanning Tree with Constant Average Distortion.
Journal of Computer and System Sciences (**JCSS 2019**).
- **Arnold Filtser**:
Steiner Point Removal with distortion $O(\log k)$, using the Relaxed-Voronoi algorithm.
SIAM Journal on Computing (**SICOMP 2019**).
- Michael Elkin, **Arnold Filtser**, Ofer Neiman:
Prioritized Metric Structures and Embedding.
SIAM Journal on Computing (**SICOMP 2018**).
- **Arnold Filtser**, Robert Krauthgamer:
Sparsification of Two-Variable Valued CSPs.
SIAM Journal on Discrete Mathematics (**SIDMA 2017**).
- Michael Elkin, **Arnold Filtser**, Ofer Neiman:
Terminal Embeddings.
Theoretical Computer Science (**TCS 2017**).

Refereed Conference Publications:

- Michael Elkin, **Arnold Filtser**, Ofer Neiman:
Distributed Construction of Light Networks
To appear: Symposium on Principles of Distributed Computing (**PODC 2020**).
- **Arnold Filtser**:
Scattering and Sparse Partitions, and their Applications
To appear: International Colloquium on Automata, Languages and Programming (**ICALP 2020**).
- **Arnold Filtser**, Omrit Filtser, Matthew J. Katz:
Approximate Nearest Neighbor for Curves --- Simple, Efficient, and Deterministic
To appear: International Colloquium on Automata, Languages and Programming (**ICALP 2020**).
- **Arnold Filtser**:
A Face Cover Perspective to ℓ_1 Embeddings of Planar Graphs
Symposium on Discrete Algorithms (**SODA 2020**).
- **Arnold Filtser**, Lee-Ad Gottlieb, Robert Krauthgamer:
Labelings vs. Embeddings: On Distributed Representations of Distance.
Symposium on Discrete Algorithms (**SODA 2020**).
- **Arnold Filtser**:
On Strong Diameter Padded Decompositions.
International Workshop on Approximation Algorithms for Combinatorial Optimization Problems (**APPROX'2019**).

- Stephen Alstrup, Søren Dahlgaard, **Arnold Filtser**, Morten Stöckel, Christian Wulff-Nilsen.
Constructing Light Spanners Deterministically in Near-Linear Time
European Symposium on Algorithms (**ESA 2019**).
- **Arnold Filtser**, Robert Krauthgamer, Ohad Trabelsi:
Relaxed Voronoi: a Simple Framework for Terminal-Clustering Problems
Symposium on Simplicity in Algorithms (**SOSA 2019**).
- **Arnold Filtser**, Ofer Neiman:
Light Spanners for High Dimensional Norms via Stochastic Decompositions.
European Symposium on Algorithms (**ESA 2018**).
- Ittai Abraham, **Arnold Filtser**, Anupam Gupta, Ofer Neiman:
Metric Embedding via Shortest Path Decompositions.
Symposium on Theory of Computing (**STOC 2018**).
- **Arnold Filtser**:
Steiner Point Removal with Distortion $O(\log k)$.
Symposium on Discrete Algorithms (**SODA 2018**).
- Ittai Abraham, Shiri Chechik, Michael Elkin, **Arnold Filtser**, Ofer Neiman:
Ramsey Spanning Trees and their Applications.
Symposium on Discrete Algorithms (**SODA 2018**).
- **Arnold Filtser**, Nimrod Talmon:
Distributed Monitoring of Election Winners.
The International Conference on Autonomous Agents & Multiagent Systems (**AAMAS 2017**). (Was nominated for best paper award) ([here](#)).
- **Arnold Filtser**, Shay Solomon:
The Greedy Spanner is Existentially Optimal.
Symposium on Principles of Distributed Computing (**PODC 2016**). Best student paper!
- Yair Bartal, **Arnold Filtser**, Ofer Neiman:
On Notions of Distortion and an Almost Minimum Spanning Tree with Constant Average Distortion.
Symposium on Discrete Algorithms (**SODA 2016**).
- Michael Elkin, **Arnold Filtser**, Ofer Neiman:
Terminal Embeddings.
International Workshop on Approximation Algorithms for Combinatorial Optimization Problems (**APPROX'2015**).
- Michael Elkin, **Arnold Filtser**, Ofer Neiman:
Prioritized Metric Structures and Embedding.
Symposium on Theory of Computing (**STOC 2015**).
- **Arnold Filtser**, Jiayi Jin, Aryeh Kontorovich, Ari Trachtenberg:
Efficient determination of the unique decodability of a string.
International Symposium on Information Theory (**ISIT 2013**).

Other Noteworthy Activities and Skills

Invited talks:

- Title: **k-terminal light trees**. 20-JUN-2013. During Theory seminar in Ben Gurion.
- Title: **Terminal embeddings into ultrametrics**. 26-MAY-2014. During Theory Seminar in computer science department, BGU.
- Title: **Prioritized Embeddings:**
 - 07-JAN-2015. Theory Seminar in the Technion.
 - 17-FEB-2015. Computer science colloquium in Ben Gurion University.
 - 04-MAR-2015. Theory Seminar in the Hebrew University.
 - 27-MAY-2015. Theory Lunch in the Weizmann institute.
 - 22-JUN-2015. Theory Seminar in the **Toronto University**.
- Title: **On Notions of Distortion and an Almost Minimum Spanning Tree with Constant Average Distortion**.
 - 14-DEC-2015. Algorithms Seminar in Tel Aviv University.
 - 02-MAR-2016. Theory Seminar in the Hebrew University.
 - 04-MAY-2016. Theory Seminar in Ariel University.
 - 28-JUN-2016. Computer science colloquium in Ben Gurion.
 - 28-FEB-2017. EADS Talk, **University of Copenhagen**.
 - 17-JUL-2017. **China Theory Week 2017** in **Shanghai**.
 - 30-NOV-2017. Computer science colloquium in Bar Ilan University.
 - 10-APR-2018. Theory Seminar in **EPFL, Lausanne**.
 - 20-MAY-2019. Algorithms Seminar in **Stony Brook University**.
- Title: **The Greedy Spanner is Existentially Optimal**
 - 17-AUG-2016. Theory Lunch in the Weizmann institute.
- Title: **Steiner Point Removal with Distortion $O(\log k)$** .
 - 06-NOV-2017. Algorithms Seminar in Tel Aviv University.
 - 20-NOV-2017. Theory Seminar in Ben Gurion University.
 - 24-JAN-2018. Theory Seminar in the Hebrew University.
 - 04-DEC-2018. Combinatorics Seminar in Ben Gurion University.
 - 21-MAY-2019. Theory Seminar in **Columbia University**.
 - 03-OCT-2019. Theory Seminar in **New York University**.
- Title: **Ramsey Spanning Trees and their Applications**
 - 20-MAR-2018. Workshop on **Data Summarization**, University of **Warwick**
- Title: **Metric embedding via shortest path decompositions**
 - 01-AUG-2018. Theory Lunch in the Weizmann institute.
- PhD talk: **On Refined Notions of Embeddings**
 - 24-MAR-2019. Computer science colloquium in Ben Gurion University.
 - 10-JUL-2019. Theory Lunch in the Weizmann institute.
- Title: **On metric embeddings, shortest path decompositions and face cover of planar graphs**
 - 15-MAY-2019. ICERM workshop on Data Science in Low-dimensional Spaces in **Brown University, Providence**.
- Title: **Scattering and Sparse Partitions, and their Applications**
 - 17-JAN-2020. **Simons collaboration** on algorithms and geometry
 - 31-JAN-2020. Theory Seminar in **Columbia University**.
 - 05-FEB-2020. Theory Seminar in **Rutgers University**.
 - 03-APR-2020. Algorithms Seminar in **Stony Brook University** (online).
- Title: **On Geometric Data Summarization**.
 - 01-APR-2020. Computer science colloquium in Bar Ilan University (online).

Conference (and other short) talks:

- **SODA 2020 (Salt Lake City):** A Face Cover Perspective to ℓ_1 Embeddings of Planar Graphs.
- **SODA 2020 (Salt Lake City):** Labelings vs. Embeddings: On Distributed Representations of Distances
- **APPROX'2019 (MIT, Cambridge):** On Strong Diameter Padded Decompositions.
- **SOSA 2019 (San-Diego):** Relaxed Voronoi: a Simple Framework for Terminal-Clustering Problems.
- **ESA 2018 (Helsinki):** Light Spanners for High Dimensional Norms via Stochastic Decompositions.
- **STOC 2018 (Los Angeles):** Metric Embedding via Shortest Path Decompositions.
- **Google Algorithms & Optimization PhD Workshop 2018 (Zurich):** Ramsey Spanning Trees and their Applications.
- **SODA 2018 (New Orleans):** Ramsey Spanning Trees and their Applications.
- **SODA 2018 (New Orleans):** Steiner Point Removal with Distortion $O(\log k)$.
- **SODA 2016 (Arlington):** On Notions of Distortion and an Almost Minimum Spanning Tree with Constant Average Distortion.
- **APPROX'2015 (Princeton):** Terminal Embeddings.
- **YR-ICALP 2015 (Kyoto):** Two Variable CSP Sparsification.
- **STOC 2015 (Portland):** Prioritized Metric Structures and Embedding.
- **ISIT 2013 (Istanbul):** Efficient determination of the unique decodability of a string.

Teaching

Psychometric course (o.k. school): 2009.

Automata and Formal Languages (T.A. in Ben Gurion university): 2013, 2014, 2015.

Discrete Structures and Combinatorics (T.A. in Ben Gurion university): 2013, 2014, 2015, 2016, 2017, 2018, 2019. During 2018, T.A. in charge.

Grading

Algorithms 2 (in Ben Gurion university): 2016, 2019

Spectral Graph Theory (in Ben Gurion university): 2016

Complexity (in Ben Gurion university): 2017, 2018