

Curriculum Vitae

Salman Parsa

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Married

Education and Past Positions

- **Duke University Computer Science**, Durham, North Carolina, USA.
PhD Student, 2010 – 2014.
Thesis Title: Algorithms for the Reeb Graph and Related Concepts.
Advisor: Herbert Edelsbrunner.
I completed my PhD while visiting IST **Austria** from 2011 to 2015.
- **Postdoc, ENS Paris France**, FSMP postdoctoral award, 08.2015- 08.2016.
- **Postdoc, IPM and Sharif University, Tehran**, Mathematics Department, 01.2017-8.2019.
- **Sharif University of Technology**, Tehran, Iran, **M. Sc.**, Computer Science
Thesis Title: Ray Tracing Acceleration Algorithms for Electromagnetic Wave Propagation Simulation, **Advisor:** A. A. Shishegar, 2007-2009.
- **Sharif University of Technology**, Tehran, Iran
B. Sc., Computer Science
GPA 16.98/20, 2003-2007

Research Interests

- Computational Aspects of Mathematics
 - Computational Topology
 - Topological Data Analysis
 - Computational Geometry
- Discrete Geometry
- Applied Algebraic Topology
- Numerical Analysis and Scientific Computing
- Computer Graphics
- Computational Complexity
- Interdisciplinary Studies

Journal Articles

- S. Parsa, "On the Links of Vertices in Simplicial d -Complexes Embeddable in the Euclidean $2d$ -Space", *Discrete & Computational Geometry* (2017).
- S. Parsa, "A Deterministic $O(m \log m)$ Time Algorithm for the Reeb Graph." *Discrete & Computational Geometry* 49(4): 864-878 (2013) [First version in SOCG 2012]

Conference Papers

- E. Chambers, J. Erickson, P. Lin, S. Parsa, "How to Morph Graphs on the Torus", to appear in SODA 2021, arXiv:2007.07927.
- Alipour S., Parsa S., Hardness of Segment Cover, Contiguous SAT and Visibility with Uncertain Obstacles. In: Combinatorial Optimization and Applications. COCOA 2020. Lecture Notes in Computer Science, vol 12577. Springer
- É. Colin de Verdière, S. Parsa, "Deciding Contractibility of a Non-Simple Curve on the Boundary of a 3-Manifold", Proceedings of the twenty-eighth annual ACM-SIAM Symposium on Discrete Algorithms. 2017, 2691-2704
- H. Edelsbrunner, S. Parsa, "On the computational complexity of Betti numbers: reductions from matrix rank," Proceedings of the twenty-fifth annual ACM-SIAM Symposium on Discrete Algorithms. 2014, 152-160.
- S. Parsa, A. Shishegar, "A Ray Tracing Acceleration Technique for Wave Propagation Modeling," *Proc. IEEE Asia-Pacific Microwave Conference, 2009*
- A. Hedayati, S. Parsa, M. Ghodsi, "Touring a Sequence of Polygons in Weighted Regions," *12th CSI Computer Conference (CSICC'2006)*, Shahid Beheshti University, Tehran, Feb 20-22, 2007

Preprints and Submitted Papers

- E. Chambers, F. Lazarus, A. de Mesmay, S. Parsa, "Algorithms for Contractibility of Compressed Curves on 3-Manifold Boundaries", submitted, arXiv:2012.02352, 2020.
- S. Parsa, A. Skopenkov, On embeddability of joins and their 'factors', arXiv preprint, arXiv:2003.12285, submitted, 2020
- S. Parsa, On the Smith classes, the van Kampen obstruction and embeddability of $[3]^* K$ arXiv preprint, arXiv:2001.06478, 2019
- S. Parsa, "Small Model 2-Complexes in 4-space and Applications." ArXiv e-prints, 1512.05152, 2015.

Teaching Experience

- Teacher, Discrete Mathematics, Saint Louis University, Spring 2020

- Teacher, Computer Organization and Design, 3 semesters, Sharif University of Tech, 2017-2019.
- Teaching Assistant, Randomized Algorithms, Duke University 2013
- Teaching Assistant, Algorithms, IST Austria, 2012
- Teaching Assistant, Artificial Intelligence, Duke University, 2011
- Teaching Assistant, Calculus 1, Sharif University of Technology, 2009
- Teaching Assistant, Scientific Computing, Sharif University of Technology, 2008
- Teaching Assistant, Numerical Analysis 2, Sharif University of Technology, 2007-2008
- Teaching Assistant, Numerical Analysis 1, Sharif University of Technology, 2007

Programming Skills

- Professional C++ Programmer, Object Oriented Software Design, Java, GAP, MATLAB, etc.

Software

- KnotHom : an application for computing the Khovanov and the grid homology of a knot, 2018.
- Reeb: an application for computing the Reeb graph, 2012.

Talks given in

- Mathematics Colloquium, Saint Louis University, 2019, Saint Louis, MO, USA.
- Seminar talk, IPM, 2019, Tehran, Iran.
- Tehran Math House, 2018, Tehran, Iran.
- Geometry and Topology Seminar, Mathematics Department, IPM, 2018, Tehran, Iran.
- Séminaire de géométrie algorithmique et combinatoire, January 2016, IHP, Paris, France.
- 24th Fall Workshop on Computational Geometry, University of Connecticut, CT, USA.
- Applied Algebraic Topology Workshop, 30 June – 4 July 2014, Castro Urdiales, CIEM, Spain.
- Yaroslavl Summer school on Discrete and Computational Geometry, title: "Computational Complexity of Betti Numbers," Yaroslavl, Russia, July 2013.

Honors

- Best Research Initiation Project (RIP), Duke University, 2012
 - Ranked 6th in "National Entrance Exam for Graduate Studies, Computer Science", 2007
 - Ranked 66th in "National Entrance Exam for Graduate Studies, Computer Engineering", 2007
 - Ranked 3rd in the 2003 Computer Science class, Sharif University of Technology and granted entrance for a Master's degree as an Exceptional Talent, 2007.
 - Ranked 996th in "National Entrance Exam for B.Sc. Studies" among more than 300,000 participants, 2003
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Review Services

Journals: Discrete & Computational Geometry, Discrete & Computational Topology, Computational Geometry: Theory and Applications.

Conferences: ACM-SIAM Symposium on Discrete Algorithms (SODA), Foundations of Computer Science (FOCS), Symposium on Computational Geometry (SOCG).

Languages

Fluent: English, Persian, **Reading, Non-fluent Speaking:** French, Arabic, German