

Kaan Sancak

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Ph.D. Student

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Education

- 2019 – Present **Ph.D., Georgia Institute of Technology** in Computer Science
Advisor: [Umit V. Catalyurek](#).
Interest: HPC, Scalable and Interpretable Graph Machine Learning, Deep Learning
GPA: 4.00/4.00
- 2015-2019 **B.Sc., Bilkent University, Turkey** in Computer Science
Ranked 4 among 231 *Summa Cum Laude*
GPA: 3.82/4.00

Experience

- 2019 – Present **Georgia Institute of Technology**
Graduate Research Assistant
Advisor: [Umit V. Catalyurek](#)
- Working on HPC, Graph Learning, and graph analytics as a member of [TDA Lab](#)
 - Recently, I have started to work on Graph Learning Interpretability and Visualization.
 - I have been working on a Multi-GPU GNN training framework in order to efficiently parallelize training of GNNs or its variants. In our efforts, we reduce the training time and memory usage of GNN training. Paper submitted to *MLSYS22*
 - Worked on Elga, a framework for computing local dynamic graph algorithms for streaming graphs in a distributed, elastic environment. Paper accepted to *SC21*.
 - Worked on clustering algorithms, specifically, streaming overlapping clustering problem in a distributed setting.
 - Worked on fast and efficient heuristic algorithms to solve symmetric rectilinear partitioning problem. Journal Paper accepted to *JEA21*.
- 05.2021 – 08.2021 **Pacific Northwest National Laboratory | PNNL**
Research Intern
Advisor: Vito Giovanni Castellana, Mahantesh Halappanavar
Team: High Performance Computing Group
Worked on Scalable High-Performance Algorithms and Data-structures library [SHAD](#).
- 05.2020 – 08.2020 **Facebook**
Research Intern
Advisor: [Satish Nadathur](#)
Team: AI Systems AI System CoDesign.
I have worked on Facebook's graph engine to improve the performance using different partitioning schemes. I have also collaborated with Instagram Ad team for integrating a clustering algorithm into Facebook pipeline.

Experience (continued)

- 2017 – 2019 **■ i-Vis (Information Visualization) Research Lab**
Undergraduate Researcher
Advisor: [Ugur Dogrusoz](#)
Studied on research and development data analytics and visualization of relational information (graph or network). Contributed [Newt](#), implemented multiple features.
- 05.2018 – 08.2018 **■ Google Summer of Code 2018**
Software Developer
Accepted by National Resource for Network Biology. Worked on *PathwayMapper Improvements and Integration into cBioPortal* project. Mentored by S.Onur Sumer and JianJiong Gao. Developed a collaborative pathway editing tool using [ShareDB](#).
- 07.2017 – 08.2017 **■ IBM**
Software Engineering Intern
Developed a file transfer application by using Bluemix, Python and Apache Kafka. Created an application recognizing objects in a production line by using OpenCV and C++. Contributed a database systems project which was a service for Bosch Germany.

Teaching Experience

- 01.2021 – 05.2021 **■ Georgia Institute of Technology** Graduate Teaching Assistant
Leading homework designs for CSE 6220 - High Performance Computing, holding office hours, and answering questions on Piazza for 120 graduate students.
- 09.2017 – 01.2018 **■ Bilkent University, Turkey** Teaching Assistant
Helped student practise enhanced object-oriented programming with Java. Graded assignments and projects for 100 students for CS 102: Algorithms and Programming II.
- 01.2017 – 05.2017 **■ Bilkent University, Turkey** Teaching Assistant
Helped student practise basic programming concepts. Graded lab assignment for 50 students for CS 114: Introduction to Programming.

Publications

Conferences


- 1 Gabert, K., Sancak, K., Özkaya, M. Y., Pınar, A. & Çatalyürek, Ü. V. (2021). ElGA: Elastic and scalable dynamic graph analysis. In *Sc21: International conference for high performance computing, networking, storage and analysis*.
- 2 Yaşar, A., Balin, M. F., An, X., Sancak, K. & Çatalyürek, Ü. V. (2021). On symmetric rectilinear matrix partitioning. *Journal of Experimental Algorithmics (JEA)*. to appear.

Under Review







- 1 Sancak*, K., Balin*, M. F. & Çatalyürek, Ü. V. (2021). Mg-gcn: Scalable multi-gpu gcn training framework.

Service






Reviewer

2021  IEEE Transactions on Big Data TBD














Skills

- Languages  **Turkish:** Native **English:** Professional **German:** Beginner
- Coding  C++, C++, Python
- Platforms  Spark, Flink, GraphX
- Web Dev  HTML, CSS, JavaScript, React, Node.js, MySQL, NoSQL,
- Tools  Git, Android Studio, Microsoft Office
- Misc.  Academic research, teaching, training, \LaTeX





Awards and Certificates

- 2019  **Summa Cum Laude**, Awarded by Department of Computer Science, Bilkent University.
- 2016-2019  **High Honor Student** Awarded 7 times for achieving a GPA above 3.50/4.00.
- 2017-2018  **IBM University Ambassador**. Awarded by IBM, Turkey.
- 2018  **Deep Learning for Computer Vision Completion Certificate** . Awarded by NVIDIA DLI.
- 2015  **Honor Student** Awarded by Department of Computer Science, Bilkent University Turkey.

Selected Projects

- SARMA**  Research/Open Source Project 
SARMA (SpatiAl Rectilinear Matrix pArtitioning) is a template-based, header only, library for spatial rectilinear partitioning. The main goal of this library to introduce novel symmetric rectilinear partitioning algorithms.
- PathwayMapper**  Open Source Project 
PathwayMapper is a web based pathway curation tool for interactive creation, editing, and sharing. Remote users to collaborate and concurrently modify pathways.
My contribution consists of implementing collaborative editing features using ShareDB with built-in conflict resolution.
- Newt**  Open Source Project 
Newt is a sample application to visualize and edit the pathway models represented by process description and activity flow languages of SBGN or in simple interaction format.
My contribution consists of implementing different features and multiple bug fixes.
- cBioPortal**  Open Source Project 
The cBioPortal for Cancer Genomics provides visualization, analysis, and download of large-scale cancer genomics data sets.
- WanderTime**  Senior Design Project 
 Won best demonstration award among over 30 projects.
A full travel itinerary generator application that optimizes trips.
- SciLib**  Course Project 
Web application that manages scientific papers, publications and conferences.

Selected Projects (continued)

- MR-MaxFlow**  Course Project
Application that uses a map-reduce based max-flow algorithm for large networks. Python, MRJob, and Google Cloud are used for development.
- Compact Mind**  Course Project 
AI application that solves NY Times daily puzzles.
- Age-Detect**  Course Project
ML/DL application that predicts ages of peoples from images using CNN architectures.

References

Available on Request