

GOLNAR GHAROONI FARD

+1(303)5706743 ◊ golnar.gharoonifard@colorado.edu

EDUCATION

University of Colorado, Boulder, CO, USA *January 2018 - Present*

PhD in Computer Science

Department of Computer science

Area of Concentration: Complex systems, Artificial intelligence

Azad University, Arak, Iran *January 2006 - August 2009*

M.Sc. of Computer engineering

Department of Computer science and Engineering

Area of Concentration: Applied chaos and optimization algorithms

Thesis: Evaluating Chaos-Genetic mapping algorithm (CGMAP) as an optimization method to solve NoC mapping problem

Azad University, Mashhad, Iran *September 2001 - January 2006*

B.Sc. of Computer Engineering

Area of Concentration: Computer engineering and electronics

Thesis: Design and implementation of smart control boards for remote monitoring of electronic farms

RESEARCH EXPERIENCE

Graduate Research Assistant *September 2018 - Present*

Peleg Lab – University of Colorado, Boulder

Research focus: Complex systems, computational modeling of honeybees' collective behavior

Research Assistant *September 2008 - January 2011*

Islamic Azad University, Tehran, Iran

Research focus: Network-on-Chip, Computational Optimization Algorithms

TEACHING EXPERIENCE

University of Colorado, Boulder, CO, USA *January 2018 - September 2019*

Graduate Teaching Assistant at Computer Science Department

Teaching assistant for Computer Systems

Ghadir Higher Education Institute, Iran *September 2014 - January 2017*

Computer and Electronics Department

Part-time lecturer on Computer Architecture, Assembly Programming, Data Structures

University of Applied Sciences and Technology, Iran *September 2014 - January 2016*

Computer Science Department

Part-time lecturer on Computer Networks, Discrete Mathematics, Assembly Language

Islamic Azad University, Damavand, Iran *September 2012 - January 2013*

Computer Science Department

Part-time lecturer on Computer Networks, Operating Systems

Ferdows Higher Education Institute, Mashhad, Iran *September 2010 - January 2012*

Lecturer, Computer Science and Engineering Department

Part-time lecturer on Introduction to Programming, Data Structures

MENTORSHIP EXPERIENCE

High School student Mentees

1. Daisy Zhang — ATHENA By WiSTEM Summer Program *July 2020 - July 2022*
2. Charlotte Gorgemans — Boulder High School *May 2018 - July 2021*
3. April Tong — Science Discovery's STEM Program, CU Boulder *May 2019 - June 2021*

Undergraduate Mentees

1. Anna Rahn — Computer Science, CU Boulder *August 2022 - Present*
2. Paul Bontempo — Aerospace Engineering, CU Boulder *May 2021 - Present*
3. Carissa Mayo — Computer Science, CU Boulder *April 2022 - Present*
4. Allison Dickie — BA, Pre-Medicine/Pre-Medical Studies, CU Boulder *April 2022 - August 2022*
5. Ashley Atkins — Mechanical Engineering, CU Boulder *May 2021 - September 2021*

Graduate Mentees

1. Chethan Kavaraganahalli Prasanna — Master of CS, CU Boulder *September 2022 - Present*
2. Morgan Byers — Master of CS, CU Boulder *June 2022 - Present*

VOLUNTEER EXPERIENCE

English-Persian Translator
TED.com, Coursera.org

September 2014 - Present

TECHNICAL STRENGTHS

Programming: MATLAB, Python, NetLogo, C++

Skills: Computational Modeling, Topological Data Analysis, Deep Learning, X-Ray Microscopy

AWARDS

Google Cloud Research

\$1000 credit to access to all Google Cloud resources for a year

February 2022

PUBLICATIONS

1. **Crystallography of honeycomb formation under geometric frustration**,
November 2022
G. Gharooni Fard, Daisy Zhang, Francisco López Jiménez, O. Peleg
Proceedings of the National Academy of Sciences 119, no. 48 (2022): e2205043119.
2. **Honey Bees Find the Shortest Path: A Collective Flow-Mediated Approach**
October 2022
D.M. T. Nguyen, **G. Gharooni Fard**, A. Atkins, P. Bontempo, M. L. Iuzzolino, O. Peleg
Artificial Life and Robotics (2022): 1-7.
3. **Robustness of Collective Scenting in the Presence of Physical Obstacles.**
June 2021
Nguyen, Dieu My T., **Golnar Gharooni Fard**, **Michael L. Iuzzolino**, and **Orit Peleg**,
Iuzzolino ML, Peleg O
Artificial Life and Robotics 27, no. 2 (2022): 286-291.

4. **Data-Driven Modeling of Distributed Resource Sharing in Honeybee Swarms**
July 2020
G. Gharooni Fard, E. Bradley, O. Peleg
In proceedings of the 2020 Conference on Artificial Life, pp. 324-332. MIT Press, 2020.
5. **A new Approach to Network on Chip Mapping Problem Using Chaos Genetic Algorithm**
May 2011
G. Gharooni Fard, F. Moein-Darbari
Book chapter: *Computational Optimization and Applications in Engineering and Industry*, Springer, Berlin, Heidelberg, pp. 245-270.
6. **Scheduling of Scientific Workflows Using Chaos Genetic Algorithm**
September 2010
G. Gharooni Fard, F. Moein-Darbari, H. Deldari, A. Morvaridi
In proceeding of International Conference on Computational Science (ICCS 2010), Vol.1, No.1, pp. 1445-1454.
7. **Evaluating the Performance of Chaos Genetic Algorithm in Solving NoC Mapping Problem**
January 2010
F. Moein-Darbari, A. Khademzade, **G. Gharooni Fard**
In proceeding of IEEE International Conference on Computational Science and Engineering, Vancouver, Canada. Vol.2, pp. 366-373.
8. **CGMAP: A New Approach to NoC Mapping Problem**
January 2009
F. Moein-Darbari, A. Khademzade, **G. Gharooni Fard**
IEICE Electronic Express, Vol.6, No.1, pp. 27-34.

PRESENTATIONS

1. **Topological Data Analysis of Spatiotemporal Dynamics of Honeybee Aggregation**
Talk
G. Gharooni Fard, M. Byers, V. Deshmukh, C. Topaz, C. Mayo, O. Peleg *January 2023*
An international conference on chaos and nonlinear dynamics, Dynamic Days US 2023.
2. **Honeycomb Formation Under Geometric Frustration**
Talk
G. Gharooni Fard, F. L. Jiménez, O. Peleg *March 2022*
Bulletin of the American Physical Society (*APS*), Chicago, IL, USA.
3. **A Persistent Homology Approach for Characterizing Honeybee Behavior during Food Exchange**
Poster
G. Gharooni Fard, V. Deshmukh, E. Bradley, C. Topaz, O. Peleg *May 2021*
Institute for Mathematical and Statistical Innovations (*IMSI*) workshop on Topological Data Analysis.
4. **An Integrated Experimental-modeling Approach to Resource Sharing in Honeybee Swarms,**
Poster
G. Gharooni Fard, E. Bradley, C. Gorgemans, O. Peleg *October 2020*
Robotic-inspired Biology workshop at the International Conference on Intelligent Robots and Systems (*IROS*).

5. **Data-Driven Modeling of Distributed Resource Sharing in Honeybee Swarms**
Extended Abstract
G. Gharooni Fard, E. Bradley, O. Peleg *June 2020*
ACM Collective Intelligence (CI 2020), Boston, MA, USA.
6. **On the Efficiency of Food Exchange via Trophallaxis; An Agent-Based Modeling Approach**
Poster
G. Gharooni Fard, E. Bradley, C. Gorgemans, O. Peleg *March 2019*
SIAM Conference on Applications of Dynamical Systems, 2019, Snowbird, UT, USA.
7. **Modeling Trophallaxis Behavior in Honeybees**
Lightening Talk *November 2018*
G. Gharooni Fard, E. Bradley, O. Peleg
Social Insects in the North East Region (*SINNERS*) conference, Drexel University, Philadelphia, PA, USA.
8. **Evaluating the performance of a chaos genetic algorithm for solving the network on chip mapping problem**
Paper Presentation *June 2010*
G. Gharooni Fard, F. Moein-darbari, A. Khademzadeh,
International Conference on Computational Science (*ICCS*), Amsterdam, Netherlands.

PAPERS IN PREPARATION / UNDER PEER REVIEW

1. **Gone With the Wind: Honey Bee Collective Scenting in the Presence of External Wind**
Full paper
D.M. T. Nguyen, **G. Gharooni Fard**, M. L. Iuzzolino, O. Peleg
Submitted to the 22nd International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2023)

OUTREACH & MEDIA COVERAGE

1. **Honeybees: Nature's puzzle solvers**
December 2022
PNAS Science Sessions Podcast
2. **How do honeybees handle geometric frustration?**
December 2022
Physics Today Article
3. **A Persistent Homology Approach to Characterize Honeybee Behavior During Food Exchange**
November 2021
SIAM News Article
4. **It takes a hive: community volunteers in honeybee research**
July 2021
CU Boulder College of Engineering and Applied Sciences