Mohammad Amin Shabani

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Research Interests

◇ Computer Vision ◇ Machine Learning ◇ Graph Theory

Education

◇ Ph.D. in **Computing Science** Sep 2019 - Present
Simon Fraser University, BC, Canada

◇ M.S. in **Electrical and Computer Engineering** Sep 2017 - Aug 2019
Seoul National University, Seoul, Korea

◇ B.S. in **Computer Science** Oct 2012 - Aug 2017
Sharif University of Technology, Tehran, Iran

Publications and Preprints

◇ Sepidehsadat Hosseini, **Amin Shabani**, Yasutaka Furukawa, *"PuzzleFusion: Unleashing the Power of Diffusion Models for Spatial Puzzle Solving,"* Thirty-seventh Conference on Neural Information Processing Systems (**NeurIPS**), 2023. (Spotlight)

◇ **Amin Shabani**, Sepidehsadat Hosseini, Yasutaka Furukawa, *"HouseDiffusion: Vector Floorplan Generation via a Diffusion Model with Discrete and Continuous Denoising,"* Conference on Computer Vision and Pattern Recognition (**CVPR**), 2023.

◇ **Amin Shabani**, Amir Abdi, Lili Meng, and Tristan Sylvain, *"Scaleformer: Iterative Multi-scale Refining Transformers for Time Series Forecasting,"* Eleventh International Conference on Learning Representations **(ICLR)**, 2023.

◇ Weilian Song, Mahsa Maleki, **Amin Shabani**, Yasutaka Furukawa, *"Vectorizing Building Blueprints,"* Proc. 16th Asian Conference on Computer Vision **(ACCV)**, 2022.

◇ **Amin Shabani**, Weilian Song, Yasutaka Furukawa, Makoto Odamaki, Hirochika Fujiki, *"Extreme Structure from Motion for Indoor Panoramas without Visual Overlaps,"* Proc. International Conference on Computer Vision **(ICCV)**, 2021.

◇ **Mohammad Amin Shabani**, Laleh Samadfam, Mohammad Amin Sadeghi, *"Local Visual Microphones: Improved Sound Extraction from Silent Video,"* Proc. British Machine Vision Conference **(BMVC)**, 2017. (Spotlight)

◇ M. Abdolmaleki · J. P. Hutchinson · S. Gh. Ilchi · E. S. Mahmoodian · N. Matsumoto · **M. A. Shabani**, *"On uniquely k-list colorable planar graphs, graphs on surfaces, and regular graphs,"* Graphs and Combinatorics **(GCOM)**, Article No s00373-018-1879-7. (Authors are ordered alphabetically)

Patents

◇ Amin Shabani, Tristan Sylvain, Lili Meng, Amir Abdi, *"Multi-scale artificial neural network and a method for operating same for time series forecasting"*, US Patent App. 18/197,197.

Presented Seminars

◇ M. Abdolmaleki, S. Gh. Ilchi, E.S. Mahmoodian, and M. A. Shabani, *"On decomposing complete tripartite graphs into 5-cycles,"* **IPM**, Institute for Research in Fundamental Sciences, Iran, 2017. (Authors are ordered alphabetically)

Academic Experience

- **Gruvi Lab**, Sep 2019 - Present
  Under the supervision of Prof. Yasutaka Furukawa, Simon Fraser University, BC, Canada.
  Working on diffusion model, extreme structure from motion for indoor panoramas and 3D reconstruction.
- **Computer Vision Laboratory**, Sep 2017 - Aug 2019
  Under the supervision of Prof. Kyoung Mu Lee, Seoul National University, Seoul, Korea.
  Worked on various computer vision and deep learning projects including small object detection, multiple pedestrian tracking, metric learning, and knowledge distillation.
- Comput Vision and Image processing, 2015 - 2017
  Under the supervision of Dr. Sadeghi and Dr. Kamali Tabrizi, Sharif University of Technology, Tehran, Iran.
  We studied local vibration patterns at different image locations. Our proposed method improved the state-of-the-art sound quality which can be extracted from a silent video.
- Graph Theory, 2014 - 2017
  Under the supervision of Prof. Mahmoodian, Sharif University of Technology, Tehran, Iran.
  Worked on decomposing complete tripartite graphs into 5-cycles and uniquely k-list colorable graphs.

Work Experience

- Adobe, June 2023 - November 2023
  Research Scientist/Engineer Intern,
  Worked on a new method for automatically generating layout designs.
- Borealis AI, Jan 2022 - May 2022
  Machine Learning Research Intern,
  Worked on Iterative Multi-scale Refining Transformers for Time Series Forecasting https://arxiv.org/abs/2206.04038
- Faraadid Company, Feb 2017 - Aug 2017
  Research and Development Engineer,
  Worked on finding online methods for car license plate detection. Considering the trade-off between speed and accuracy, we mainly focused on optimizing different methods for our target datasets.

Teaching Experience

- Teaching Assistant for **Data Structure**. Fall 2014
- Teaching Assistant for **Image Processing**. Fall 2016
- Teaching Assistant for **Discrete Mathematics**. Spring 2014
- Teaching Assistant for **Computer Programming**. Fall 2013
- Teaching **Informatics Olympiad** courses, NODET HighSchools. 2011 - 2017
- Teaching **C++ Programming**, NODET HighSchools. 2011 - 2017

Honors and Awards

- **Helmut & Hugo Eppich Family Grad Scholarship, SFU** Spring 2023
- **SFU Computing Science Graduate Fellowship** Fall 2020 - 2022
- **Helmut & Hugo Eppich Family Grad Scholarship, SFU** Spring 2021
- **Graduate Scholarship for Excellent Foreign Students, SNU** Sep 2017 - Sep 2019
- **SFU Graduate Fellowship** Fall 2019 - 2022
- **SFU Research Assistant Scholarship** Spring 2020 - Spring 2023

- **SFU Teaching Assistant Scholarship** Summer 2020 - Fall 2022
- **Bronze Medal** in the 20th Iranian National Olympiad in Informatics (INOI), Tehran, Iran. Jul 2010.
- Selected as a member of National Elites Foundation, Iran. Aug 2010.

Extracurricular Activities

- Reviewer for NeurIPS2023, SIGGRAPHA2023, ICCV2023, CVPR2023, ACCV2022, ICCV2021
- **YSC**, Young Scholar Club, Tehran, Iran. Jul 2010 - Sep 2011
- **Hamband**, Student council of department of mathematics, SUT. 2014 - 2016
- **Algorithms and Problem Solving Laboratory**,under supervision of Prof. Yahya Tabesh, Sharif University of Technology, Tehran, Iran. 2015 - 2016

Technical Skills

- *Languages & Frameworks:* Python, C++(STL), Pytorch, Tensorflow, Matlab