Reyhaneh NESHATAVAR

PERSONAL DATA

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RESEARCH INTERESTS

Computer Vision
Deep Learning
3D Vision
Self-supervised Learning
Graph Theory

EDUCATION

- 2020 - present Ph.D in Electrical and Computer Engineering, Seoul National University, Seoul, South Korea.

- 2015 - 2017 M.Sc in Mathematics and Computer Science-Graph Applications, Amirkabir University of Technology, Tehran, Iran.

- 2010 - 2014 B.Sc in Mathematics and it's Application in Industrial Engineering, Amirkabir University of Technology, Tehran, Iran.

- 2006 - 2009 Diploma in Mathematics and Physics, Zahraye Athar High School, Tehran, Iran.

RESEARCH EXPERIENCE

Spring 2022

Self-supervised Point Cloud Completion
Adviser: Prof. Kyoung Mu Lee
This paper has been submitted to CVPR2023

Spring 2022

Self-supervised Image Super-resolution
Adviser: Prof. Kyoung Mu Lee
This paper has been submitted to CVPR2023

Summer 2018

Applications of Graph Coloring in Schedule Problem(Train Timetabling)
Adviser: Prof. Dariush Kiani
The goal of this research is to present a Graph algorithm to solve Train Timetabling problem. This algorithm uses the Maximum Flow to increase the number of trains in the urban scheduling with a minimum delay. Our algorithm provides the maximum number of trains (in spite of time interference) by creating a Time Maximum Flow. Then, eliminate the interactions of these trains by finding the Maximum Independent Set (MIS).
Graduate Thesis

Fall 2014	Speed-up Benders Decomposition using new Cut
	Adviser: Associate Prof. Mehdi Qatee
	Undergraduate thesis

Publications

Winter 2022	**CVF-SID: Cyclic multi-Variate Function for Self-Supervised Image Denoising by Disentangling Noise from Image**
	Reyhaneh Neshatavar, Mohsen Yavartanoo, Sanghyun Son, Kyoung Mu Lee
	In this paper, we propose a novel and powerful self-supervised denoising method called CVF-SID based on a Cyclic multi-Variate Function (CVF) module and a self-supervised image disentangling (SID) framework. The CVF module can output multiple decomposed variables of the input and take a combination of the outputs back as an input in a cyclic manner. Our CVF-SID can disentangle a clean image and noise maps from the input by leveraging various self-supervised loss terms. Unlike several methods that only consider the signal-independent noise models, we also deal with signal-dependent noise components for real-world applications. Furthermore, we do not rely on any prior assumptions about the underlying noise distribution, making CVF-SID more generalizable toward realistic noise.
	This paper is accepted in CVPR2022.
	https://arxiv.org/abs/2203.13009

Summer 2021	**PolyNet: Polynomial Neural Network for 3D Shape Recognition with PolyShapeRepresentation**
	Mohsen Yavartanoo, Shih-Hsuan Hung, Reyhaneh Neshatavar, Yue Zhang, Kyoung Mu Lee
	In this paper, we propose PolyNet,a DNN-based method over a specific polygon mesh representation (PolyShape) with a multi-resolution structure. PolyNet contains two operations; (1) a polynomial convolution (PolyConv) operation with learnable coefficients, which learns continuous distributions as the convolutional filters to share the weights across different vertices, and (2) a polygonal pooling (PolyPool) procedure by utilizingthe multi-resolution structure of PolyShape to aggregate the features in a much lower dimension.
	This paper is accepted in 3DV2021.
	https://arxiv.org/abs/PolyNet

Summer 2021	**3DIAS: 3D Shape Reconstruction with Implicit Algebraic Surfaces**
	Mohsen Yavartanoo, JaeYoung Chung, Reyhaneh Neshatavar, Kyoung Mu Lee
	In this paper, we propose an implicit algebraic surface with learnable coefficients to represent thesurface of the 3D shape. This approach provides a differentiable and compact surface of 3D shapes, which can bepolygonized, rendered, and transformed efficiently.
	This paper was acctepted in ICCV2021.
	https://openaccess.thecvf.com/content/ICCV2021/3DIAS

Winter 2021	**3D Shape Reconstruction Using Multivariate Quartic Polynomial Surface Set** (다변수 사차 다항 곡면 집합을 이용한 삼차원 형상 재구성)
	Mohsen Yavartanoo, Jaeyoung Chung, Reyhaneh Neshatavar, Kyoung Mu Lee
	This paper is accepted in IPIU2021.

Teaching Experience

- Spring 2021 Seoul National University, Teaching Assistant, Department of Electrical and Computer Engineering, **Introduction to Computer Vision**

- Fall 2015-Winter 2017 Amirkabir Univresity of Technology, Teaching Assistant, Department of Mathematics and Computer Science, **General Mathematics 1 and 2**.

- Winter 2013 Amirkabir Univresity of Technology, Teaching Assistant, Department of Mathematics and Computer Science, **Optimization Research**.

- Teaching Painting as Student Working at Amirkabir Univresity of Technology.

Awards and Scholarships

- **Gold Prize** for the "3D Shape Reconstruction Using Multivariate Quartic Polynomial Functions" paper in the 33rd Workshop on Image Processing and Understanding (IPIU 2021). This award is given because it was selected as an excellent paper.

- Merit-based scholarship (Spring 2021) due to academic excellence and good grades.

- SNU Global Scholarship for one year (2020)

Other Academic Experiences

- *2023* Invited to serve as a reviewer for the 2023 IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR2023)

- *2022* Invited to serve as a reviewer for International Journal of Image and Graphics.

- *2022* Invited to serve as a reviewer for IEEE Transactions on Neural Networks and Learning Systems.

Working Experinence

- Jun.2019-Jan.2020 Seoul National University, CVLab, **Research Intern**.

- 2014-2017 Jahan Pardaz Teb Company, Part Time Job, **Web Designer, Graphic Designer, Film Editor**.

Languages

Persian:	Native
English:	Fluent
Korean:	Basic
Arabic:	Basic

Computer Skills

Python, Pytorch, Tensorflow, Matlab, C Programming, AIMMS, HTML, Wordpress CMS, Joomla CMS, Blender, Adobe Photoshop CS8, Illusterator, Corel Draw, Video Edition Edius 7, LaTeX

Art Skills

Painting with Oil Color, Creta Color, Water Color
Playing Piano and Guitar

Behavioral Strenghts

Flexibility
Perseverance
Responsibility
Commitment and Service Motive
Problem Solving and Decision Making
Creativity and Innovation
Team Work

REFERENCES

- Professor Lee, Kyoung Mu, Professor of Computer Vision, Machine Learning, Artificial Intelligence, kyoungmu@snu.ac.kr, Department of Electrical and Computer Engineering, College of Engineering, Seoul National University, Seoul, South Korea.

- Professor D. Kiani, Professor of Mathematics-Algebra, dkiani@aut.ac.ir, Department of Computer science and Mathematics, Amirkabir University of Technology, Tehran, Iran.