MATTHEW **PEIZHI YAN**

Ph.D. Candidate at UBC

Homepage: yan.auroratns.com Email: yanpz [at] ece [dot] ubc [dot] ca

RESEARCH INTERESTS

- **Computer Vision**: 3D face and general object reconstruction from 2D images; image generation.
- **Computer Graphics**: NeRF; 3D Gaussian Splatting (3DGS); 3D face modeling.
- **Machine Learning**: Large-Language-Models; foundational 3D generation models; explainable ML.

EDUCATION

- **The University of British Columbia** Jan. 2021 – Ongoing
  Vancouver, British Columbia, Canada — ***Ph.D. Candidate*** *in Electrical and Computer Engineering*
  Supervisors: Dr. Rabab Ward, Dr. Shan Du
  Thesis: Learning-based 3D Human Face Creation
  GPA: 4.0 / 4.0 (Average Grade: 95%, Letter: A+)
- **Lakehead University** Sept. 2018 – May 2020
  Thunder Bay, Ontario, Canada — ***M.Sc.*** *in Computer Science*
  Supervisor: Dr. Salimur Choudhury
  Thesis: Towards Machine Learning Enabled Future-Generation Wireless Network Optimization
  GPA: 4.0 / 4.0 (Average Grade: 98%, Letter: A+)
  Distinction: Governor-General's Gold Medal
- **Algoma University** Sept. 2016 – May 2018
  Sault Ste. Marie, Ontario, Canada — ***B.Sc.*** *in Computer Science*
  Supervisors: Dr. Yi Feng, Dr. George Townsend
  GPA: 4.0 / 4.0 (Average Grade: 96%, Letter: A+)
- **University of Jinan** Sept. 2014 – June 2019
  Jinan, Shandong, China — ***B.Eng.*** *in Computer Science*

RESEARCH AND WORK EXPERIENCE

The University of British Columbia	**Research Assistant**	Jan. 2021 – Present
BC Cancer Research Centre	**Research Assistant**	Jun. 2024 – Oct. 2024
Lakehead University	**Research Assistant and Graduate TA**	Sept 2018 – May 2020
Algoma University	**Research Assistant at BCI Lab**	2017 - 2018

TEACHING EXPERIENCE

Lakehead University

- **Guest Lecturer (9 hours):** *Optimization Method (2020 Spring),* graduate-level course, 29 students
- **Guest Lecturer (6 hours):** *Deep Learning (2020 Winter),* graduate-level course, 83 students
- **Guest Lecturer (6 hours):** *Computer Vision (2019 Fall),* graduate-level course, 70 students
- **Guest Lecturer (9 hours):** *Deep Learning (2019 Spring),* graduate-level course, 59 students
- **Guest Lecturer (6 hours):** *Optimization Method (2019 Spring),* graduate-level course, 19 students
- **Tutor:** *Assembly Language (2019 Winter),* undergraduate-level course, 38 students

▪ **Tutor**: *Data Base Management Systems (2018 Fall),* undergraduate-level course, 25 students

ACADEMIC SERVICE

Leadership and Organizational Roles

▪ **Program Committee Member** for Graphics Interface Conference (**GI 2025**)
▪ **Volunteer** at IEEE Canadian Conference on Electrical and Computer Engineering (**CCECE 2025**)
▪ **Vice President** of Turing Computer Association (S/W Dept.), Univ. of Jinan, China (2015-2016)

Journal Reviewing

▪ **IEEE** *Transactions on Circuits and Systems for Video Technology (TCSVT)* – 25 reviews
▪ **IEEE** *Transactions on Visualization and Computer Graphics (TVCG)* – 1 review
▪ **IEEE** *Transactions on Multimedia (TMM)* – 1 review
▪ **IEEE** *Canadian Journal of Electrical and Computer Engineering (CJECE)* – 4 reviews
▪ **Elsevier** *Neurocomputing* – 13 reviews
▪ **Springer** *Neural Computing and Applications* – 1 review
▪ **IEEE** *Transactions on Cybernetics* – 1 review
▪ **IEEE** *Access* – 1 review

Conference Reviewing

▪ 2025 Graphics Interface (**GI 2025**) Conference
▪ 2022 Asian Conference on Computer Vision (**ACCV 2022**)
▪ 2021 to 2023, & 2025 IEEE International Conference on Image Processing (**ICIP**)
▪ 2020 The 17th IEEE International Conference on Ubiquitous Intelligence and Computing

Talks and Presentations

▪ **Presenter** at UBC ECE Research Day (2025)
▪ **Speaker** at BC Cancer Summit on Skin Lesion Image Synthesis with Controllable Skin Tone (2024)
▪ **Guest Speaker** at Consortium for Advancement of MRI Education and Research in Africa (2023)
▪ **Invited Talk** on Machine Learning in 3D Face Modeling at UBC (Okanagan) COSC Seminar (2023)

PUBLICATIONS

Citations: 178 h-index: 8 i10-index: 7 (statistics are from Google Scholar)

Journal

1. **Yan, P.**, Ward, R., Tang, Q., & Du, S. (2025), "Neural 3D Face Shape Stylization Based on Single Style Template via Weakly Supervised Learning", *IEEE Transactions on Visualization and Computer Graphics (TVCG)*. (SCI Journal, IF: 4.7)
2. Liu, W., Hopkins, A. M., **Yan, P.**, Du, S., Luyt, L. G., Li, Y., & Hou, J. (2023), "Can Machine Learning 'Transform' Peptides/Peptidomimetics into Small Molecules? A Case Study with Ghrelin Receptor Ligands", *Molecular Diversity*, 1-17. (SCI Journal, IF: 3.364)
3. **Yan, P.**, & Choudhury, S. (2021), "Deep Q-Learning Enabled Joint Optimization of Mobile Edge Computing Multi-Level Task Offloading", *Elsevier Computer Communications*. (SCI Journal, IF: 3.923)
4. **Yan, P.** [C], Paul, A. [C], Yang, Y., Zhang, H., Du, S. & Wu, J. (2021), "Non-Iterative Online Sequential Learning Strategy for Autoencoder and Classifier", *Springer Neural Computing and Applications*. (SCI Journal, IF: 6.106)
5. Tassone, J., **Yan, P.**, Simpson, M., Mendhe, C., Mago, V., & Choudhury, S. (2020), "Utilizing Deep Learning and Graph Mining to Identify Drug Use on Twitter Data". *BMC Medical Informatics and Decision Making*, *20*(11), 1-15. (SCI Journal, IF: 3.546)

6. **Yan, P.**, Al-Turjman, F., Al-Oqily, I., & Choudhury, S. (2020), "An Energy-Efficient Topology Control Algorithm for Optimizing the Lifetime of Wireless Ad-hoc IoT Networks in 5G and B5G" . *Computer Communications*. Elsevier. (SCI Journal, IF: 3.923)
7. **Yan, P.**, Choudhury, S., & Wei, R. (2020), "A Machine Learning Auxiliary Approach for the Distributed Dense RFID Readers Arrangement Algorithm". *Intelligent and Cognitive Techniques for Internet of Things, IEEE Access Journal.* (SCI Journal, IF: 5.456)
8. **Yan, P.**, & Feng, Y. (2018), "Using Convolution and Deep Learning in Gomoku Game Artificial Intelligence". *Modern Physics Letters A*, 28(03). (SCI Journal, IF: 1.367)

Conference

9. **Yan, P.***, Ward, R., Tang, Q., & Du, S., "Estimating Virtual Camera FOV to Reduce Perspective Shape Distortion in 2D-to-3D Face Reconstruction". Accepted by *the International Conference on Image Processing (ICIP)*. 2025.
10. **Yan, P.***, Ward, R., Tang, Q., & Du, S., "Gaussian Deja-vu: Creating Controllable 3D Gaussian Head Avatars with Enhanced Generalization and Personalization Abilities". In *Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)*. 2025. (**Oral; Accepted in Round 1; Acceptance rate 12%**)
11. Qiu, Z.*, **Yan, P.**, & Cai, Z., "Large Language Models for Second Language English Writing Assessments: An Exploratory Comparison". In *Proceeding of the 38th Pacific Asia Conference on Language, Information and Computation (PACLIC 38)*. 2024.
12. **Yan, P.***, Ward, R., Wang, D., Tang, Q., & Du, S., "Learning Disentangled Features for NeRF-based Face Reconstruction". In *Proceedings of the International Conference on Image Processing (ICIP)*. 2023.
13. **Yan, P.***, Gregson, J., Tang, Q., Ward, R., Xu, Z., & Du, S. "NEO-3DF: Novel Editing-Oriented 3D Face Creation and Reconstruction". In *Proceedings of the Asian Conference on Computer Vision (ACCV)*. 2022.
14. Mehajabin, N., **Yan, P.**, Kaur, S., Song, J., Pourazad, M. T., Wang, Y., ... & Nasiopoulos, P. An Efficient Refocusing Scheme for Camera-Array Captured Light Field Video for Improved Visual Immersiveness. In *Proceedings of the 55th Hawaii International Conference on System Sciences*. 2022
15. **Yan, P.***, & Choudhury, S., "Optimizing Mobile Edge Computing Multi-Level Task Offloading via Deep Reinforcement Learning". In *Proceedings of the ICC 2020-2020 IEEE International Conference on Communications (ICC)*. IEEE. 2020.
16. Emu, M., **Yan, P**.*, Choudhury, S., "Latency Aware VNF Deployment at Edge Devices for IoT Services: An Artificial Neural Network Based Approach". In *Proceedings of the ICC 2020-2020 IEEE International Conference on Communications (ICC) on Convergent IoT*. IEEE. 2020
17. **Yan, P.***, Choudhury, S., & Wei, R. "A Distributed Graph-Based Dense RFID Readers Arrangement Algorithm". In *Proceedings of the ICC 2019-2019 IEEE International Conference on Communications (ICC)* (pp. 1-6). IEEE. May, 2019.
18. **Yan, P.***, & Feng, Y. "A Hybrid Gomoku Deep Learning Artificial Intelligence". In *Proceedings of the 2018 Artificial Intelligence and Cloud Computing Conference* (pp. 48-52). ACM. December, 2018.

Preprint

19. **Yan, P.**, Ward, R., Wang, D., Tang, Q., & Du, S., "StyleMorpheus: A Style-Based 3D-Aware Morphable Face Model". arXiv preprint. 2025. (Work completed in 2023)

* indicates the presenter.
C indicates co-first authorship.

SELECTED AWARDS AND HONORS

Canada

- (2020) **The Governor-General's Gold Medal Award** (Canada's highest award in graduate level)
- (2018) **Vector Scholarship in Artificial Intelligence (VSAI)** by Vector Institute, $17,500

University of British Columbia

- (2023) ICICS Travel Award
- (2021, 2022, 2023) Graduate Support Initiative (GSI) Award

Other

- (2025) IEEE Signal Processing Society (SPS) Travel Grant

PROJECTS

Research-Oriented

- (2024-2025) **3D Head Reconstruction** and **Tracking** (https://github.com/PeizhiYan/flame-head-tracker) ★ 80+ Stars
  - **Description**: In this project, I developed a 3D head tracking pipeline capable of performing 3D head reconstruction from a single image or tracking the 3D head from a monocular video. The tracker estimates 3D face parameters, including shape, expression, and texture, as well as additional parameters such as camera pose and lighting. The results can be used in 3D head avatar training, video aftereffects, etc.

- (2024) **Gaussian Deja-vu**: 3DGS-based 3D Head Creation (https://peizhiyan.github.io/docs/dejavu) ★ 40+ Stars
  - **Description**: In this project, I proposed a 3D Gaussian-based method for creating animatable head avatars using monocular video as training data. This work was accepted at WACV 2025 in the first round.

- (2024) Mesh-based Neural 3D Face Style Transfer (https://peizhiyan.github.io/docs/style)
- (2023) **StyleMorpheus**: NeRF-based 3D Face (https://github.com/ubc-3d-vision-lab/StyleMorpheus)
- (2022) **NEO-3DF**: 3D Face Creation and Editing (https://peizhiyan.github.io/docs/neo3df)
- (2019) Deep Learning 4X **Video Super-Resolution** (https://www.youtube.com/watch?v=W8TxAPylE0Y)

Other Open-Source Projects

- (2025) **Gmesh**: Differentiable Hybrid 3DGS + Mesh Rendering Pipeline (https://github.com/PeizhiYan/gmesh)
  - **Description**: Gmesh is a PyTorch-based pipeline for differentiable hybrid rendering of scenes that combine 3D Gaussians and meshes. By integrating the strengths of both representations, Gmesh enables flexible and realistic 3D scene rendering within a single framework. Built on top of gsplat and PyTorch3D, it supports end-to-end learning and seamless integration with PyTorch workflows.

- (2021) **ZenFlow** Open-Source Machine Learning Demo (https://github.com/PeizhiYan/zenflow)
- (2021) Light-Field Refocusing Algorithm User Interface (https://www.youtube.com/watch?v=pRxXQcuVQSs&t=9s)
- (2019) Open-Source **Whiteboard Web App.** (https://peizhiyan.github.io/www/draw.html)
- (2018) Convolution-Based **Gomoku Game AI** (https://peizhiyan.github.io/js_codes/gomoku)

SUPERVISED AND MENTORED STUDENTS

- **Haoyu Wang** (supervised incoming Ph.D. student at UBC Okanagan, research assistant, Sept – Dec. 2024)
  Projects: 3D face and head tracking; 2D image ear landmark detection.
- **Xiangrui Liu** (supervised master's student at UBC Okanagan, research assistant, May – Aug. 2023)

Project: 3D and 3D-aware face modeling.

- **Md Nafis Abedin** (supervised student at University of Waterloo, co-op 2020 summer intern)
  Project: Developing an interactive web user interface for the satellite image lichen mapping project.
- **Keizo Kato** (mentored student at UBC Okanagan, 2023) on his undergraduate thesis.
- **Marshall Wenqi Guo** (mentored student at UBC Okanagan, 2023) on his undergraduate thesis.

TECHNICAL SKILLS

- **Programming Languages:** Python, Java, C++, C, JavaScript
- **Open-Source Libraries:** PyTorch, Tensorflow, Keras, Open3D, OpenCV, Gurobi, Paper.js, React
- **Computer Networking:** VPN, SSH, SAMBA, FTP, Router Settings (DHCP, NAT)
- **Others:** LaTeX, Linux, SLURM (HPC), Photoshop, Blender

OTHER OPEN-SOURCE CONTRIBUTIONS

- **Simple-KNN (used by 3DGS):** Solved a CUDA device-related issue (PR accepted).
  https://github.com/camenduru/simple-knn

Updated on July 02, 2025