# MATTHEW **PEIZHI YAN**

Ph.D. Candidate at UBC | Founder of Aurora Technology and Solutions
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## 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

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

## TEACHING EXPERIENCE

### Lakehead University

- Guest Lecturer (9 hours): Optimization Method (2020 Spring), graduate-level, 29 students
- Guest Lecturer (6 hours): Deep Learning (2020 Winter), graduate-level, 83 students

- Guest Lecturer (6 hours): Computer Vision (2019 Fall), graduate-level, 70 students
- Guest Lecturer (9 hours): Deep Learning (2019 Spring), graduate-level, 59 students
- Guest Lecturer (6 hours): Optimization Method (2019 Spring), graduate-level, 19 students
- Tutor: Assembly Language (2019 Winter), undergraduate-level, 38 students
- Tutor: Data Base Management Systems (2018 Fall), undergraduate-level, 25 students

## ACADEMIC SERVICE

### Organizational Roles

- (ICIP 2025) Session Chair: Biomedical Signal and Image Processing 3
- (GI 2025) Program Committee Member for Graphics Interface Conference
- (CCECE 2025) Volunteer at IEEE Canadian Conference on Electrical and Computer Engineering
- (2015-2016) Vice President of Turing Computer Association (S/W Dept.), Univ. of Jinan, China

### Journal Reviewing

- IEEE Transactions on Circuits and Systems for Video Technology (TCSVT) 25 reviews
- IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI) 1 review
- IEEE Transactions on Visualization and Computer Graphics (TVCG) 1 review
- IEEE Transactions on Image Processing (TIP) 1 review
- IEEE Transactions on Multimedia (TMM) 4 reviews
- IEEE Canadian Journal of Electrical and Computer Engineering (CJECE) 4 reviews
- IEEE Transactions on Cybernetics 1 review
- ACM Trans. on Multimedia Computing, Communications, and Application (TOMM) 1 review
- Elsevier Neurocomputing 13 reviews
- Springer Neural Computing and Applications 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

- (2025) Presenter at UBC ECE Research Day
- (2024) Speaker at BC Cancer Summit on Skin Lesion Image Synthesis with Controllable Skin Tone
- (2023) 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

## PUBLICATIONS

**Citations: 190** **h-index: 9** **i10-index: 8** **(statistics are from Google Scholar)**

### Journal

1. **Yan, P.**, Ward, R., Wang, D., Tang, Q., & Du, S. (2025), "StyleMorpheus: Learning a StyleGAN-Based 3D-Aware Morphable Face Model with a Disentangled Style Space". *Elsevier Neurocomputing,* 131329. (SCI Journal, IF: 6.5)
2. **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),* 31(10), 9522 – 9529. (SCI Journal, IF: 4.7)
3. 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*, 27(5), 2239-2255. (SCI Journal, IF: 3.364)
4. **Yan, P.**, & Choudhury, S. (2021), "Deep Q-Learning Enabled Joint Optimization of Mobile Edge Computing Multi-Level Task Offloading", *Elsevier Computer Communications,* 180, 271-283. (SCI Journal, IF: 3.923)

5. **Yan, P.**[F], Paul, A.[F], Yang, Y., Zhang, H., Du, S. & Wu, J. (2021), "Non-Iterative Online Sequential Learning Strategy for Autoencoder and Classifier", *Springer Neural Computing and Applications (NCAA),* 33(23), 16345-16361. (SCI Journal, IF: 6.106)
6. 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), 304. (SCI Journal, IF: 3.546)
7. **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". *Elsevier Computer Communications,* 159, 83-96. (SCI Journal, IF: 3.923)
8. **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,* 8, 42270-42284. (SCI Journal, IF: 5.456)
9. **Yan, P.**, & Feng, Y. (2018), "Using Convolution and Deep Learning in Gomoku Game Artificial Intelligence". *Modern Physics Letters A*, 28(03), 1850011. (SCI Journal, IF: 1.367)

## Conference

10. **Yan, P.***, Ward, R., Tang, Q., & Du, S., "Estimating Virtual Camera FOV to Reduce Perspective Shape Distortion in 2D-to-3D Face Reconstruction". In Proceedings of the *International Conference on Image Processing (ICIP)*. 2025.
11. **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%)**
12. 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.
13. **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.
14. **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.
15. 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
16. **Yan, P.***, & Choudhury, S., "Optimizing Mobile Edge Computing Multi-Level Task Offloading via Deep Reinforcement Learning". In Proceedings of the *IEEE International Conference on Communications (ICC)*. IEEE. 2020.
17. 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 *IEEE International Conference on Communications (ICC) on Convergent IoT*. IEEE. 2020
18. **Yan, P.***, Choudhury, S., & Wei, R. "A Distributed Graph-Based Dense RFID Readers Arrangement Algorithm". In Proceedings of the *IEEE International Conference on Communications (ICC)* (pp. 1-6). IEEE. May, 2019.
19. **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.

## Submitted

20. **Yan, P.**, Ward, R., Tang, Q., & Du, S., "ArchitectHead: Continuous Level of Detail Control for 3D Gaussian Head Avatars". In arXiv preprints. 2025. (Submitted for review in 2025.)
21. Yu, X., **Yan, P.**[C], Liu, S. & Wu, C. "MMFashion+: Multimodal Federated Learning for Personalized Clothing Recommendation". Submitted to *IEEE Transactions on Consumer Electronics*.

* presenter.
[F] co-first authorship.
[C] correspondence author.

## 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, CA$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
  ☆ GitHub 110+ Stars
  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 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
  ☆ GitHub 50+ Stars
  Developed 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=W8Tx`

### Other Open-Source Projects

- (2025) Gmesh: Differentiable Hybrid 3D Rendering Pipeline https://github.com/PeizhiYan/gmesh
  Developed a pipeline for differentiable hybrid rendering of scenes that contains both 3D Gaussians and 3D meshes. It supports end-to-end learning and seamless integration with Pytorch pipelines.

- (2021) ZenFlow: Open-Source Machine Learning Demo https://github.com/PeizhiYan/zenflow
- (2021) Light-Field Refocusing Algorithm Demo 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 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 undergrad 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 Oct. 17, 2025