

# JIANAN CHEN

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Last updated: January 2023

## OVERVIEW

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I am a Ph.D. candidate in the Department of Medical Biophysics at University of Toronto. My research has been focused on the stratification of cancer patients using medical image analysis. I am interested in developing unsupervised and weakly-supervised algorithms to solve clinical problems.

## EDUCATION

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**Ph.D. Medical Biophysics**, University of Toronto, Toronto, CA (2018 - )  
Supervisor: Anne Martel

**M.Sc. Web Intelligence** King's College London, London, UK (2016 - 2017)  
M.Sc. in Web Intelligence High Distinction

**B.Eng. Communications Engineering**, Shanghai University, Shanghai, China (2010 - 2014)  
B.Eng. in Communications Engineering First Class Honours

## PREPRINTS

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- Chen, J.**, Liu, L.Y., Han, W., Wang, D., Cheung, A.M., Tsui, H. and Martel, A.L., 2022. General stain deconvolution of histopathology images with physics-guided deep learning. bioRxiv.
- Balsiger, F., Jungo, A., **Chen, J.**, Ezhov, I., Liu, S., Ma, J., Paetzold, J.C., Sekuboyina, A., Shit, S., Suter, Y. and Yekini, M., 2021. The MICCAI Hackathon on reproducibility, diversity, and selection of papers at the MICCAI conference. arXiv preprint arXiv:2103.05437.
- Chen, J.** and Martel, A.L., 2022. Metastatic Cancer Outcome Prediction with Injective Multiple Instance Pooling. arXiv preprint arXiv:2203.04964.

## CONFERENCE PUBLICATIONS

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- Chen, J.**, Cheung, H., Milot, L. and Martel, A.L., 2021. AMINN: Autoencoder-based Multiple Instance Neural Network Improves Outcome Prediction of Multifocal Liver Metastases. *Accepted for Oral presentation*, International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI), 2021. *Oral presentation*
- Ma, J., Wei, Z., Zhang, Y., Wang, Y., Lv, R., Zhu, C., Chen, G., Liu, J., Peng, C., Wang, L., Wang, Y. and **Chen, J.** How Distance Transform Maps Boost Segmentation CNNs: An Empirical Study. In Medical Imaging with Deep Learning, 2020.
- Chen, J.**, Amemiya, Y., Kuling, G., Fashandi, H., Yerofeyeva, Y., Hussein, H., Slodkowska, E., Ginty, F., Seth, A., Yaffe, M. and Martel, A.L., Texture heterogeneity of breast tumour in magnetic resonance imaging can be explained by differentially regulated genes. In Proceedings of San Antonio Breast Cancer Symposium, AACR, 2019.
- Chen, J.**, Milot, L., Cheung, H.M. and Martel, A.L., Unsupervised Clustering of Quantitative Imaging Phenotypes Using Autoencoder and Gaussian Mixture Model. In International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI), 2019.

## JOURNAL PUBLICATIONS

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8. Ma, J., **Chen, J.**, Ng, M., Huang, R., Li, Y., Li, C., Yang, X. and Martel, A.L., 2021. Loss Odyssey in Medical Image Segmentation. Medical Image Analysis, 2021.
9. Gao, M., Liu, S., **Chen, J.**, Gordon, K.C., Tian, F. and McGoverin, C.M., 2021. Potential of Raman Spectroscopy in Facilitating Pharmaceutical Formulations Development. An AI perspective. International Journal of Pharmaceutics, 2021.
10. Ma, J., Wang, Y., An, X., Ge, C., Yu, Z., **Chen, J.**, Zhu, Q., Dong, G., He, J., He, Z. and Nie, Z., 2020. Towards Efficient COVID-19 CT Learning: A Benchmark for Lung and Infection Segmentation. Medical Physics, 2020.
11. Zheng, L., Shen, L., **Chen, J.**, An, P. and Luo, J., No-reference quality assessment for screen content images based on hybrid region features fusion. IEEE Transactions on Multimedia, 2019.
12. **Chen, J.**, Shen, L., Zheng, L. and Jiang, X., Naturalization module in neural networks for screen content image quality assessment. IEEE Signal Processing Letters, 2018.

## WORKSHOP PUBLICATIONS

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13. Ma, J. and **Chen, J.**, 2022. NnUNet with Region-based Training and Loss Ensembles for Brain Tumor Segmentation. In International MICCAI Brainlesion Workshop (pp. 421-430). Springer, Cham.
14. Ciga, O., **Chen, J.** and Martel, A., 2019. Multi-layer domain adaptation for deep convolutional networks. In Domain Adaptation and Representation Transfer and Medical Image Learning with Less Labels and Imperfect Data, (DART-MICCAI) 2019.

## PATENT

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15. System and Methods for Stain Deconvolution (Provisional)

## REVIEW CONTRIBUTIONS

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International Conference on Medical Image Computing & Computer Assisted Intervention (MICCAI) 2020 - 2022	
Medical Image Analysis	2021
Frontiers in Oncology	2021-2022
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)	2018

## TEACHING EXPERIENCE

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**Teaching assistant**, Vector Institute & Michener Institute  
 AICC110 - AI for Clinician Champions Certificate Program, Winter 2021  
**Teaching assistant**, University of Toronto  
 CSC401/2511 - Natural Language Computing, Spring 2019 **Supervisor:** Prof. Frank Rudzicz  
 CSC108 - Introduction to Programming, Fall 2020

## SELECTED AWARDS

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MBP Caven Fellowship, \$ 2500 CAD  
 Nominated for Ontario Graduate Scholarship (Top 2 out of 96 among MBP International students)  
 MICCAI Travel Award 2021, \$ 500 USD  
 Medical Biophysics Excellence Award 2020-2022, \$ 26000 CAD combined

Best Contribution Award, MICCAI Hackathon 2020, \$ 500 USD

Vector-Mitacs Accelerate Fellowship (declined), \$10000 CAD

Sunnybrook Research Institute Travel Award, \$ 1500 CAD

Steve Barker Memorial Prize – Top 1 of KCL Web Intelligence Class, £ 1000 GBP

First prize scholarship – Top 5% of SHU Communications Engineering Class, ¥ 3000 CNY

## REFERENCES

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### **Anne Martel, PhD**

Doctoral supervisor and research mentor

Senior scientist, Physical Sciences, Odette Cancer Research Program, Sunnybrook Research Institute

Professor, Medical Biophysics, University of Toronto

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### **Juri Reimand, PhD**

Doctoral supervisory committee member

Principal investigator, Computational Biology Program, Ontario Institute for Cancer Research

Associate professor, Departments of Medical Biophysics and Molecular Genetics, University of Toronto

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