Peter Plantinga

Curriculum Vitae as of January 2025

Identification

Office Address	The Neuro, Montreal Neurological Institute-Hospital Room 251C, 3801 Rue University Montréal, QC H3A 2B4
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Education

Calvin University	Dates	August 2007 – May 2012
BCS in	Majors	Computer Science, Physics
Computer Science	Advisor	Joel Adams, Ph.D.
	Sr. Project	Open MPI Parallelization for Simulating Dynamics of High-intensity Laser Interactions with Atomic Helium
The Ohio State University	Dates	August 2015 – August 2021
	Major	Artificial Intelligence
PhD in	Minors	Linguistics, Statistics
Computer Science	Advisor	Eric Fosler-Lussier, Ph.D.
	Thesis	Interpretable Knowledge Transfer for Machine Learning of Speech Tasks
McGill University	Dates	September 2024 – Present
Postdoctoral	Department	Neurology and Neurosurgery
Researcher	Advisors	Denise Klein, Ph.D. and Mirco Ravanelli, Ph.D.
	Project	Speech as Biomarker: Interpretable Deep Learning for Early Detection of Neurodegenerative Diseases

Professional Experience

Postdoctoral Researcher

McGill University — Department of Neurology and Neurosurgery

From September 2024 to present, in Montreal, QC

Reproduced traditional vocal features such as jitter, shimmer, and harmonicity using PyTorch and SpeechBrain, as well as a tutorial and comparisons with OpenSMILE and PRAAT. Developed recipes for detection of Parkinson's and Alzheimer's disease from speech recordings.

Applied AI/ML Lead

JPMorganChase — Machine Learning Center of Excellence (MLCOE)

From June 2021 to August 2024, in Columbus, OH

Productionized proprietary and open-source speech recognition systems with patent-pending technologies, made with semi-supervised fine-tuning on thousands of hours of bank call center data. Filed for three other patents related to automatic complaint identification from transcripts and other metadata generation and correction from video transcripts.

Graduate Research Intern

Mila, Quebec Artificial Intelligence Institute — SpeechBrain Project

From January 2020 to May 2021, in Montreal, QC

Designed the core architecture for SpeechBrain, a toolkit that streamlines experiments with audio as an input. Engineered the systems for distributed experiments, hyperparameter selection, data augmentation tools, and the core trainer class. Wrote numerous tutorials and recipes for speech enhancement and noise-robust automatic speech recognition.

Graduate Research Assistant

The Ohio State University — Speech and Language Technologies (SLaTe) Lab

From May 2017 to May 2021, in Columbus, OH

Achieved the lowest word error rate on the CHiME-2 speech separation and recognition dataset with a new algorithm for providing perceptual feedback to an enhancement model. Developed algorithms for helping kids learn how to read by tracking errors made while reading out loud.

Social Media Intern

Disability Rights Education and Defense Fund (DREDF)

From August 2012 to July 2013, in Berkeley, CA

Produced a new website for the organization meeting the highest level of accessibility standards. Added requested improvements to the customer relations management software.

Resident Assistant

Calvin University — Residence Life

From August 2010 to May 2011, in Grand Rapids, MI

Mentored students through one-on-one meetings about daily life, and created programs for education regarding sustainable living and spiritual formation.

Software Engineer

Hymnary.org

From May 2010 to May 2012, in Grand Rapids, MI

Engineered a search engine that searches over a million hymn records in less than a second. Designed an algorithm for identifying types of data from page scans using just a few labels.

Student Researcher

Calvin College — Department of Physics

From May 2008 to May 2012, in Grand Rapids, MI

Explored the dynamics of high-intensity laser interactions with atomic helium using classical simulations. Used OpenMPI to speed up the Fortran simulation recipe by several orders of magnitude with both compute parallelism and data parallelism.

Teaching Experience

Graduate Teaching Assistant

The Ohio State University — Department of Computer Science and Engineering

From May 2017 to May 2021, in Columbus, OH

Developed and taught a curriculum for an undergraduate Artificial Intelligence course. Taught four semesters of an introductory programming course for computer science majors.

Foreign Language Teacher

Yancheng Teachers University — Department of Foreign Languages

From August 2013 to May 2015, in Yancheng, Jiangsu, China

Developed curricula and taught courses in Marketing, Management, Oral English, English Writing, and Web Development, at the business school and the foreign language school.

Funding and Awards

Calvin Research Fellowship
Awarded by: Physics Department, Calvin University
Awarded for: Research on femto-scale computer simulations of double ionization of helium, conducted over three years of undergraduate degree

CCA Computing Award
Awarded by: Computer Science Department, Calvin University
Awarded for: Top performing student in graduating class

University Graduate Fellowship
Awarded by: Computer Science and Engineering Department, the Ohio State University
Awarded for: Recruiting highly-qualified students

Graduate Teaching Associateship
Awarded by: Computer Science and Engineering Department, the Ohio State University
Awarded for: Teaching courses in introductory programming and Artificial Intelligence

Graduate Research Associateship
Awarded by: Computer Science and Engineering Department, the Ohio State University
Awarded for: Reading RACES project — teaching children how to read through automatic tracking of oral reading progress and detecting disfluencies

Presentations

Peter Plantinga, “Parameter Averaging is All You Need to Prevent Forgetting.” Conversational AI Reading Group at Mila, November 21, 2024.

Peter Plantinga, “Continual Learning for End-to-End ASR by Averaging Domain Experts.” SpeechBrain Summit, August 28, 2023.

Aku Rouhe, **Peter Plantinga,** Titouan Parcollet, and Mirco Ravanelli, “A SpeechBrain for Everything: State of the PyTorch Ecosystem for Speech Technologies.” Tutorial at INTERSPEECH, 2022.

Peter Plantinga, Deblin Bagchi, and Eric Fosler-lussier, “Spectral Mapping Using Residual Networks and Mimic Loss.” Midwest Speech and Language Days, Notre Dame University, South Bend, Indiana, USA, May 11, 2018.

Peter Plantinga, “A Realism Objective for Speech Denoising with Deep Learning.” Oral Presentation, Calvin University CS Colloquium, Grand Rapids, MI, USA, March 13, 2018.

Publications

Peter Plantinga and Briac Cordelle, “Parkinson’s Speech and Voice AI.” GitHub Repository, 2024. https://github.com/pplantinga/ParkinsonSpeechAI/

Peter Plantinga, Jaekwon Yoo, Abenezer Girma, and Chandra Dhir, “Parameter Averaging is All You Need to Prevent Forgetting.” Proceedings of IEEE Workshop on Spoken Language Technologies (SLT), 2024. https://massey-plantinga.com/assets/parameter_averaging_forgetting.pdf

Alexander Johnson, **Peter Plantinga**, Pheobe Sun, Swaroop Gadiyaram, Abenezer Girma, and Ahmad Emami, “Efficient SQA from Long Audio Contexts: A Policy-Driven Approach.” Proceedings of INTERSPEECH, 2024. https://www.isca-archive.org/interspeech_2024/johnson24_interspeech.html

Mirco Ravanelli, Titouan Parcollet, Adel Moumen, Sylvain de Langen, Cem Subakan, **Peter Plantinga,** Yingzhi Wang, Pooneh Mousavi, Luca Della Libera, Artem Ploujnikov, Francesco Paissan, Davide Borra, Salah Zaiem, Zeyu Zhao, Shucong Zhang, Georgios Karakasidis, Sung-Lin Yeh, Pierre Champion, Aku Rouhe, Rudolf Braun, Florian Mai, Juan Zuluaga-Gomez, Seyed Mahed Mousavi, Andreas Nautsch, Xuechen Liu, Sangeet Sagar, Jarod Duret, Salima Mdhaffar, Gaelle Laperriere, Mickael Rouvier, Renato De Mori, and Yannick Esteve, “Open-Source Conversational AI with SpeechBrain 1.0.” Journal of Machine Learning Research (JMLR), 2024.

Peter Plantinga, Jaekwon Yoo, and Chandra Dhir. “Systems and Methods for Continual Learning for End-to-End Automatic Speech Recognition.” U.S. Patent Application No. 18/442,974, 2024.

Peter Plantinga, Jaekwon Yoo, and Chandra Dhir, “Continual Learning for End-to-End ASR by Averaging Domain Experts.” ArXiv Preprint, 2023. https://arxiv.org/abs/2305.09681

Siva Tanuku, Matthew Ray, Rachel Brinda, Liping Wu, Tiffany Wagner, Bhavya Potluri, Khyati Sinha, Serdar Kuyuk, Anand Joglekar, **Peter Plantinga**, and Kai Ni, “System and Method for Real-Time Identification of Dissatisfaction Data.” U.S. Patent Application No. 17/992,269, 2023.

Peter Plantinga, Deblin Bagchi, and Eric Fosler-Lussier, “Perceptual Loss with Recognition Model for Single-Channel Enhancement and Robust ASR.” ArXiv preprint, 2021. https://arxiv.org/abs/2112.06068

Szu-Wei Fu, Cheng Yu, Tsun-An Hsieh, **Peter Plantinga,** Mirco Ravanelli, Xugang Lu, and Yu Tsao, “MetricGAN+: An Improved Version of MetricGAN for Speech Enhancement,” Proceedings of INTERSPEECH, 2021. https://arxiv.org/abs/2104.03538

Peter Plantinga, “Interpretable Knowledge Transfer for Machine Learning of Speech Tasks.” PhD Dissertation, The Ohio State University, 2021. http://rave.ohiolink.edu/etdc/view?acc_num=osu1620686523241649

Mirco Ravanelli, Titouan Parcollet, **Peter Plantinga,** Aku Rouhe, Samuele Cornell, Loren Lugosch, Cem Subakan, Nauman Dawalatabad, Abdelwahab Heba, Jianyuan Zhong, Ju-Chieh Chou, Sung-Lin Yeh, Szu-Wei Fu, Chien-Feng Liao, Elena Rastorgueva, François Grondin, William Aris, Hwidong Na, Yan Gao, Renato De Mori, and Yoshua Bengio, "SpeechBrain: A General-Purpose Speech Toolkit." ArXiv Preprint, 2021. https://arxiv.org/abs/2106.04624

Mirco Ravanelli, Titouan Parcollet, **Peter Plantinga,** Aku Rouhe, Samuele Cornell, Loren Lugosch, Cem Subakan, Nauman Dawalatabad, Abdelwahab Heba, Jianyuan Zhong, Ju-Chieh Chou, Sung-Lin Yeh, Szu-Wei Fu, Chien-Feng Liao, Elena Rastorgueva, François Grondin, and William Aris, "SpeechBrain." GitHub Repository, 2021. https://github.com/speechbrain/speechbrain

Peter Plantinga and Aku Rouhe, "HyperPyYAML." GitHub Repository, 2021. https://github.com/speechbrain/HyperPyYAML

Peter Plantinga, Deblin Bagchi, and Eric Fosler-Lussier, "Phonetic Feedback For Speech Enhancement With and Without Parallel Speech Data." Proceedings of IEEE International Conference on Audio, Speech, and Signal Processing (ICASSP), 2020. https://arxiv.org/abs/2003.01769

Peter Plantinga and Eric Fosler-Lussier, "Towards Real-Time Mispronunciation Detection in Kids' Speech." Proceedings of IEEE Workshop on Automatic Speech Recognition and Understanding (ASRU), 2019. https://arxiv.org/abs/2003.01765

Peter Plantinga, "Mimic-Enhance." GitHub Repository, 2019. https://github.com/OSU-slatelab/mimic-enhance

Peter Plantinga, Deblin Bagchi, and Eric Fosler-Lussier, "An Exploration of Mimic Architectures for Residual Network Based Spectral Mapping." Proceedings of IEEE Workshop on Speech and Language Technologies (SLT), 2018. https://arxiv.org/abs/1809.09756

Deblin Bagchi, **Peter Plantinga,** Adam Stiff, and Eric Fosler-Lussier, "Spectral Feature Mapping with Mimic Loss for Robust Speech Recognition." Proceedings of IEEE International Conference on Audio, Speech, and Signal Processing (ICASSP), 2018. https://arxiv.org/abs/1803.09816

Stan Haan, Zach Smith, Katie Shomsky, **Peter Plantinga,** and Tim Atallah, "Anticorrelated Electrons from High-Intensity Nonsequential Double Ionization of Atoms," Phys. Rev. A 81, 023409, 2010. DOI: http://dx.doi.org/10.1103/PhysRevA.81.023409

Stan Haan, Zach Smith, Katie Shomsky, and **Peter Plantinga,** "Electron Drift Directions in Strong-Field Double Ionization of Atoms," J. Phys. B 42, 134009, 2009. http://iopscience.iop.org/0953-4075/42/13/134009

Stan Haan, Zach Smith, Katie Shomsky, and **Peter Plantinga,** "Anticorrelated Electrons from Weak Recollisions in Non-Sequential Double Ionization," J. Phys. B: At. Mol. Opt. Phys. 41, 211002, 2009. http://iopscience.iop.org/0953-4075/41/21/211002