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| **Nicholas Vadivelu** | | [nicholasvadivelu.com](https://nicholasvadivelu.com/) [github.com/n2cholas](https://github.com/n2cholas) [nicholas.vadivelu@gmail.com](mailto:nicholas.vadivelu@gmail.com) |
| Experience | Citadel **·** Quantitative Research Intern *Jun 2021 – Aug 2021*  \ NVIDIA **·** Performance Software Engineering Intern *Aug 2020 – Dec 2020*   * Reduced BERT/Megatron **inference latency by up to 30%** by enabling sparsity for **TensorRT** in **C++** * Open-sourced sparse BERT in **Python**, democratizing the current fastest inference implementation   Uber ATG **·** Research Intern *Jan 2020 – Aug 2020*   * Improved **object detection by** **90%** (AP) and **motion forecasting by** **22%** (L2) of a self-driving neural net under realistic positional error, significantly improving safety for future riders * Wrote a **first author paper** on the learned positional error correction system (accepted at CoRL)   Google Brain **·** Research Software Engineering Intern *May 2019 – Aug 2019*   * Link[Unlocked K-FAC for **over 370,000 users** by implementing and open-sourcing automatic support for arbitrary neural network architectures and integrating it into the Keras ecosystem](https://github.com/tensorflow/kfac/tree/master/kfac/python) * Enabled simple **multi-node, multi-GPU/TPU training** with efficient distributed operation placement * Link[Designed, created, and open-sourced idiomatic, reproducible training recipes for users](https://github.com/tensorflow/kfac/tree/master/kfac/examples/keras)   John Hancock Financial **·** Data Science Intern *May 2018 – Aug 2018*   * Achieved a **fraud detection rate of** **63%** through designing an unsupervised machine learning model * Deployed 25 fraud identifying heuristics in **SQL** that **correctly** **flagged 100+** fraudulent claims   Sunnybrook Research Institute **·** Software Developer Intern *Jul 2017 – Aug 2017*   * Improved MRI segmentation accuracy by **up to 80%** by via techniques like watershed and clustering * Reduced time to contour MRI scans from **~5 hrs to ~40 mins** through automation software | |
| Publications | [Link](https://arxiv.org/abs/2011.05289)[**Nicholas Vadivelu**, Mengye Ren, James Tu, Jingkang Wang, Raquel Urtasun. Learning to Communicate and Correct Pose Errors. In *Conference on Robot Learning (CoRL)*, Virtual, 2020](https://arxiv.org/abs/2011.05289)  [Link](https://arxiv.org/abs/2010.09063)[Pranav Subramani,](https://arxiv.org/abs/2010.09063) **[Nicholas Vadivelu](https://arxiv.org/abs/2010.09063)**[, Gautam Kamath. Enabling Fast Differentially Private SGD via Just-in-Time Compilation and Vectorization. In](https://arxiv.org/abs/2010.09063) *[NeuRIPS PPML Workshop](https://arxiv.org/abs/2010.09063)*[, Virtual, 2020](https://arxiv.org/abs/2010.09063) | |
| Open Source | [Link](https://github.com/pytorch/ignite/pull/1238)[PyTorch Ignite:](https://github.com/pytorch/ignite/pull/1238)[Improved metrics performance by](https://github.com/pytorch/ignite/pull/1238) **[up to 63%](https://github.com/pytorch/ignite/pull/1238)** [by designing and implementing](https://github.com/pytorch/ignite/pull/1238) **[async updates for distributed metrics](https://github.com/pytorch/ignite/pull/1238)** [with tests and documentation](https://github.com/pytorch/ignite/pull/1238) | |
| Leadership | [Link](https://github.com/n2cholas/dsc-workshops)[Data Science Club Lectures: Designed and presented workshops on neural networks, machine learning, data cleaning, data visualization, MLOps, clustering, and more for **600+ students**](https://github.com/n2cholas/dsc-workshops)  WATonomous Design Team: Implemented real-time object detection in **Tensorflow** and **OpenCV** | |
| Projects | [Link](https://github.com/n2cholas/pokemon-analysis)[Pokemon Analysis:Scraped, visualized, and analyzed data with Markov chains, boosting,and more](https://github.com/n2cholas/pokemon-analysis)  [Link](https://github.com/n2cholas/ThriveLifeSimulator)[Link](https://github.com/n2cholas/jax-resnet)[JAX ResNet:](https://github.com/n2cholas/jax-resnet) [Open-sourced composable, unit-tested code and checkpoints for ResNet variants](https://github.com/n2cholas/jax-resnet)  [Thrive Life Simulator:Created a **3D ray-casting engine** from scratch for](https://github.com/n2cholas/ThriveLifeSimulator) a [game in **Java**](https://github.com/n2cholas/ThriveLifeSimulator)  [Link](https://pypi.org/project/shapecheck/)[ShapeCheck:](https://pypi.org/project/shapecheck/) [Published a framework agnostic runtime array/tensor checking library with CI to](https://pypi.org/project/shapecheck/) **[PyPI](https://pypi.org/project/shapecheck/)** | |
| Education | University of Waterloo **·** Computer Science & Statistics (B. Math) *2017 – 2022*  Research Assistant (Advisors: G. Kamath Fall 2020, P. Poupart Fall 2019, L. Tan Winter 2019) Cumulative GPA: 3.94/4.00 - Dean's List | |