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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 | NVIDIA **·** Performance Software Engineering Intern *Aug 2020 – Present*   * Optimizing sparse BERT inference performance for **TensorRT** in **C++**, enabling a potential **50% reduction** in inference time, memory usage, and power usage for customers   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 **·** 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** for users by incorporating **TensorFlow's** Distribution Strategy and efficient distributed operation placement * Link[Designed, created, and open-sourced idiomatic, reproducible training recipes for users while carefully considering hyperparameter ranges, baselines, datasets, and models](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 ML model * Deployed 25 fraud identifying rules in **SQL** that **correctly** **flagged 100+ out of 20,000+** claims * Worked closely with clinicians to extract features from **5 new data sources** using **pandas**   Sunnybrook Research Institute **·** Software Developer Intern *Jul 2017 – Aug 2017*   * Improved MRI segmentation accuracy by **up to 80%** and reduced time to contour MRI scans from **~5 hrs to ~40 mins** by implementing techniques including watershed and clustering | |
| 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[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 Privacy-Preserving Machine Learning Workshop](https://arxiv.org/abs/2010.09063)*[, Virtual, 2020](https://arxiv.org/abs/2010.09063) | |
| Open Source | Link[PyTorch Ignite:](https://github.com/pytorch/ignite/pull/1238)[Improved 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[Data Science Club Lectures: Designed and presented workshops about neural networks in **TensorFlow**,machine learning in **scikit-learn**,and data cleaning in **pandas** for **300+ students**](https://github.com/n2cholas/dsc-workshops)  WATonomous Design Team: Implemented real-time object detection in **Tensorflow, OpenCV** | |
| Projects | Link[Competitive Pokemon Analysis:Scraped, visualized, analyzed, and modeled Pokemon data with random forests, boosting trees, and Markov chains in **pandas**, **scikit-learn**, and **matplotlib**](https://github.com/n2cholas/pokemon-analysis)  Link[Thrive Life Simulator:Created a **3D ray-casting game engine** from scratch for a dinosaur world simulation game in **Java** with **object-oriented design** and detailed documentation­](https://github.com/n2cholas/ThriveLifeSimulator) | |
| Education | University of Waterloo **·** Computer Science & Statistics (B. Math) *2017 – 2022*  Cumulative GPA: 3.94/4.00 - Dean's List | |