Daniel de Souza Severo

For more information: https://dsevero.com

BIO & RESEARCH INTERESTS

Broadly, my interests are information theory, generative modeling, and data compression. Current compression algorithms are not well suited to handle structured and high-dimensional data, such as images and graphs. I'm interested in building computationally efficient entropy coders that can be used with deep generative models. I have 5 years of industry experience applying machine learning to real-world problems, as well as open-source contributions to large projects such as Dask and NeuralCompression.

EDUCATION

University of Toronto
Electrical & Computer Engineering
- Doctor of Philosophy (Ph.D.) — Started Fall 2020
- Undergraduate Exchange Program (1 year) — 2013 - 2014

Federal University of Santa Catarina, Brazil — 2010 - 2015
Bachelor of Science in Electronics Engineering
First Class Honours, 99th percentile.

RESEARCH EXPERIENCE

Facebook AI Research (FAIR) — New York, Summer 2021
Research Scientist Intern with Karen Ullrich

Vector Institute for AI — Toronto, 2020 - Current
Ph.D. Student Researcher with Alireza Makhzani

PUBLICATIONS

Reys, Arthur D., Danilo Silva, Daniel Severo, et al.: *Predicting Multiple ICD-10 Codes from Brazilian-Portuguese Clinical Notes*. Accepted at BRACIS 2020. arXiv: 2008.01515 [cs.CL].

Ruan*, Yangjun, Karen Ullrich*, Daniel Severo*, et al.: *Improving Lossless Compression Rates via Monte Carlo Bits-Back Coding*. Accepted as a Long Talk at ICML 2021. arXiv: 2102.11086 [cs.LG].

Severo, Daniel, Elad Domanovitz, and Ashish Khisti: *Regularized Classification-Aware Quantization*. Accepted at BSC 2021. arXiv: 2107.09716 [cs.LG].

Severo*, Daniel, James Townsend*, Ashish Khisti, et al.: *Your Dataset is a Multiset and You Should Compress it Like One*. Accepted as a Talk in Deep Generative Models and Downstream Applications Workshop @ NeurIPS 2021. 2021.

PREPRINTS

Severo, Daniel, Flávio Amaro, Estevam R. Hruschka Jr, et al.: *Ward2ICU: A Vital Signs Dataset of Inpatients from the General Ward*. 2019. arXiv: 1910.00752 [cs.LG].

Severo*, Daniel, James Townsend*, Ashish Khisti, et al.: *Compressing Multisets with Large Alphabets*. 2021. arXiv: 2107.09202 [cs.IT].

AWARDS

Vector Scholarship in AI Recipient 2020-21 — 2020
The Vector Scholarship in AI supports the recruitment of top students to AI-related master's programs in Ontario and is valued at $17,500.
https://vectorinstitute.ai/aimasters

NSERC Applied Research Rapid Response to COVID-19 Grant — 2020
Our project titled "Canadian Hospital Simulator For Management of COVID19 Cases and Contact Tracing" was awarded $75,000.00.
https://www.nserc-crsng.gc.ca/Innovate-Innover/CCI-COVID_eng.asp

Virtual Design Challenge Winner 2019
Won 1st place at the VDC hosted by The University of British Columbia with my paper *Proof of Novelty*. Received a cash prize of $3,000.
`https://github.com/dsevero/Proof-of-Novelty`

Student Merit Award and Medal 2015
Graduated with the highest GPA ever obtained (at the time) for my major. Elected "Best Student" by the faculty of Electrical & Electronics Engineering at the Federal University of Santa Catarina.

Science Without Borders Scholarship 2013
Awarded a full scholarship that covered tuition, transportation, necessary materials and living costs to study 2 academic semesters at the University of Toronto.

TEACHING EXPERIENCE

Federal University of Santa Catarina - *Teaching Assistant*
- Communications Theory — Fall and Winter 2015
- Introduction to Electronics — Fall and Winter 2013
- Single-Variable Calculus — Fall 2010

CERTI Foundation - *Programming Instructor* 2010 - 2013

OPEN SOURCE CONTRIBUTIONS

Craystack
- `https://github.com/j-towns/craystack/pulls?q=author:dsevero`

Neural Compression
- `https://github.com/facebookresearch/NeuralCompression`

Dask & Dask-ML
- `https://github.com/dask/dask/pulls?q=author:dsevero`
- `https://github.com/dask/dask-ml/pulls?q=author:dsevero`

OTHER PROFESSIONAL EXPERIENCE

3778 Healthcare - *Machine Learning Engineer* 2018 - 2020
Linx Impulse - *Head of Data Science* 2016 - 2018
CERTI Foundation - Research Engineer 2015 - 2016
Wavetech Technology - *Embedded Systems Intern* 2015
CERTI Foundation - Electrical Engineering Intern 2010 - 2013
WEG Industries - *Electrical Engineering Intern* Summers 2011 and 2012

REFERENCES

Prof. Ashish Khisti University of Toronto
Professor and Canada Research Chair (Tier II)
Department of Electrical & Computer Engineering
`https://www.comm.utoronto.ca/~akhisti/`

Prof. Alireza Makhzani Vector Institute
Faculty member at the Vector Institute for Artificial Intelligence
Adjunct Professor and Canada CIFAR AI Chair
Department of Electrical & Computer Engineering
`http://www.alireza.ai/`

Karen Ullrich, Ph.D. Facebook AI Research (FAIR)
Research Scientist
`https://karenullrich.info/`

James Townsend, Ph.D. University College London
`https://j-towns.github.io/`

Prof. Frank R. Kschischang University of Toronto
Distinguished Professor of Digital Communication

Department of Electrical & Computer Engineering
https://www.comm.utoronto.ca/frank/