

NICOLAS BERTAGNOLLI

nbertagnolli.com

EDUCATION

University of Utah

May 2016

Masters in Computer Science; GPA 3.7/4.0

- ◆ Coursework: Advanced Algorithms, Scientific Visualization, Structured Prediction, Clustering, Data Mining, Convex Optimization, Computer Architecture, Operating Systems

University of Utah

May 2014

Bachelor of Science in Mathematics with a minor in Biomedical Engineering; GPA: 3.7/4.0

- ◆ Coursework: Machine Learning, Probabilistic Graphical Models, Digital Circuits, Genomic Signal Processing, Modern Algebra, Real Analysis, Numerical Analysis, Probability Theory

SKILLS

Languages

- ◆ Python, R, Scala, Java, Processing, JavaScript, PHP, Haskell, Racket, C/C++, Verilog, SQL

Software/Hardware

- ◆ Tensorflow, PyTorch, Keras, MXNet, Spark, Hadoop, Docker, UNIX, git, AWS, GCP, LaTeX

Miscellaneous

- ◆ Strong communication and technical writing
- ◆ Avid skier, mountain biker, climber, martial artist, and flautist

WORK EXPERIENCE

Branded Entertainment Network– Provo, UT

June 2023-Present

Principle Machine Learning Engineer

- ◆ Architected SDXL API for training/serving custom generative models on customer images
- ◆ Architected and implemented a semantic database allowing engineers to query our data lake using human language. Enabled queries like, “give me all videos which contain a red car” or “find all thumbnails like this image”.
- ◆ Lead the rearchitecture and migration of the MLOps platform to use modern tools like Metaflow.

MPathic– Seattle, WA

Aug 2020-May 2023

Co-Founder and Chief AI Officer

- ◆ Built a scalable accredited web application providing training to therapists across the U.S as a means to bootstrap quality data.
- ◆ Built an API allowing business partners to incorporate generative empathy corrections into their native applications.
- ◆ Scaled business from two founders to over 20 employees in under a year and from zero to over eight Million in valuation.
- ◆ **Designed and built MLOps platform from annotation to model training and deployment capable of taking concept through labeled data and deployed production model in under a day.**
- ◆ **Created and successfully piloted first ML system for automated validation of FDA clinical trials.**
- ◆ **Invented data augmentation around model uncertainty improving model performance by as much as 2x.**

Branded Entertainment Network– Provo, UT

Aug 2021-Aug2022

Director of Machine Learning

- ◆ Lead team of engineers and data scientists to solve BEN’s ML challenges.
- ◆ Work with leadership to establish business strategy related to data and our statistical capabilities.

Branded Entertainment Network– Provo, UT

April 2020-Aug 2021

Principle Data Scientist

- ◆ Technical lead on team of data scientists and engineers.
- ◆ Designed BEN’s influencer discovery tools to allow campaign managers to find influencers who are similar to each other
- ◆ Built an automated experimentation platform to help campaign managers learn what factors contribute to success over time
- ◆ Designed state of the art video action recognition models in PyTorch
- ◆ Architected systems for one click deployment of web applications and APIs for Data Scientists to bring real value to clients. Data Scientists could self serve models to business leaders in under a week.
- ◆ **Invented fundamental audience understanding models using graph neural networks leading to multi million dollar deals and improvement in conversions by as much as 120%.**

Lyssn.io, Inc – Seattle, WA

Nov 2017-April 2020

Senior Machine Learning Engineer

- ◆ Designed and implemented NLP models for scaling automatic evaluation and annotation of 100k+ audio recordings of therapy
- ◆ Architected and implemented Lyssn’s NLP and Audio machine learning systems.
- ◆ Designed and implemented website features including billing, and HIPAA compliant session sharing

3M Health Information Systems – Salt Lake City, Utah

Feb 2018-March 2019

Senior Data Scientist

- ◆ Lead research efforts on applications of deep neural networks to medical coding of raw clinical texts
- ◆ Designed systems for explainable and interpretable deep models in medical coding leading to two patents

3M Health Information Systems – Salt Lake City, Utah

June 2016-Feb 2018

Data Scientist

- ◆ Worked on the Performance Matrix product with Verily Life Sciences to design algorithms and systems capable of leveraging 3M's large quantity of medical data in order to improve patient care and decrease healthcare costs
- ◆ Helped architect the predictive portion of the Performance Matrix Platform using Docker, GCP, and Spark
- ◆ Lead research efforts on applications of deep neural networks to medical coding

Passive Logic – Salt Lake City, Utah

Jan 2016-June 2019

Software Engineer

- ◆ Designed and implemented online interactive data visualizations to convey information about users' resource consumption

University of Utah – Salt Lake City, Utah

Aug 2014-Dec 2015

Graduate Research Assistant, Learning Lab

- ◆ Designed algorithms for learning distributed representations of general structures
- ◆ Rigorously proved relationships between known algorithms and leveraged these results to create new methods in natural language processing and machine learning

University of Utah – Salt Lake City, Utah

Aug 2011-May 2014

Research Assistant, Genomic Signal Processing Lab

- ◆ Studied mathematical and computational techniques for the analysis of high throughput genetic assays
- ◆ Developed algorithms for the discovery of novel biological phenomena from data using matrix factorizations
- ◆ Created software to simultaneously extract meaningful patterns from metabolic and transcriptomic data using SVD

University of Utah – Salt Lake City, Utah

Nov 2009-Oct 2011

Research Assistant, Department of Oncology

- ◆ Constructed, amplified, and maintained various fluorescent protein plasmids
- ◆ Imaged cytoskeleton protein dynamics in living cells using confocal microscopy
- ◆ Designed and implemented software for fluorescent protein localization and distribution image analysis using Matlab

CONSULTING

Youper, Inc. – San Francisco, CA

May 2020-Jul 2020

- ◆ Designed deep conversational agents for therapeutic interventions

Loveland Innovations – Pleasant Grove, UT

Nov 2018-Jan 2020

- ◆ Built out model comparison and evaluation framework

Voicery – San Francisco, CA

Aug 2018-Feb 2019

- ◆ Worked on improving models to mimic human speech patterns.

Parendo LLC – Salt Lake City, UT

Aug 2017-Aug 2018

- ◆ Designed, implemented, and deployed fitness application concept from scratch in PHP www.gitfit.us

Rio Tinto (Kennecott) – South Jordan, UT

Aug 2016-Feb 2017

- ◆ Created a truck maintenance schedule optimization tool hosted with AWS Elastic Beanstalk and Docker.

Skullcandy – Park City, UT

Feb 2016-Aug 2016

- ◆ Created a music preference analysis app in python using kivy and sklearn

Dycap – Gainesville, FL

Nov 2015-Feb 2016

- ◆ Designed and implemented a real time facial recognition, and optical flow tracking system in C++

PUBLICATIONS

- ◆ S. Carvalho, **N. M. Bertagnolli** and T. Folkman (2021) “*Temporal Bottleneck Attention for Video Recognition*,” ICMLA
- ◆ M. Tanana, C. S. Soma, P. B. Kuo, **N. M. Bertagnolli**, A. Dembe, B. T. Pace, V. Srikumar, D. C. Atkins and Z. E. Imel (2020) “*How do you feel? Using Natural Language Processing to automatically rate emotion in psychotherapy.*,” Behavior Research Methods
- ◆ J. M. Tennessen, **N. M. Bertagnolli**, L. Evans, M.H. Sieber, J. Cox and C. S. Thummel (2014) “*Drosophila Embryogenesis and the onset of aerobic glycolysis*,” G3: Genes, Genomes, Genetics 4(5): 839-850.
- ◆ **N. M. Bertagnolli**, J. A. Drake, J. M. Tennessen and O. Alter (2013) “*SVD Identifies Transcript Length Distribution Functions from DNA Microarray Data and Reveals Evolutionary Forces Globally Affecting GBM Metabolism*,” PLoS ONE 8(11): e78913

PATENTS

- ◆ Schubert R. Carvalho **Bertagnolli, N. M.**, Tyler Folkman, Richard R. Buttler (2021). “*A Temporal Bottleneck Attention Architecture for Video Action Recognition*.” (International Publication No.17/350,283)

- ◆ Lord, S. P., **Bertagnolli, N. M.** (2021). “*System and method for increasing effective communication through evaluation of multimodal data, auto-correction and behavioral suggestions based on models from evidence-based counseling, motivational interviewing, and empathy.*” (U.S. Patent Application No. 63/180,325).
- ◆ **Bertagnolli, N. M.**, Rocco, D. R., Coonradt, C. A. (2020). “*Predictive system for request approval*” (International Publication No. WO 2020/109950 A1).
- ◆ Xinzi, W., **Bertagnolli, N. M.**, Jimmy. (2020). “*Neural network model with evidence extraction*”

PRESENTATIONS

- ◆ **N. M. Bertagnolli**, J. A. Drake, J. M. Tennessen and O. Alter “*SVD Identifies Transcript Length Distribution Functions from DNA Microarray Data and Reveals Evolutionary Forces Globally Affecting GBM Metabolism,*” *Biomedical Engineering Society Annual Meeting (BMES) 2013* (Seattle, Washington, September 25, 2013- September 27, 2013), contributed poster.
- ◆ **N. M. Bertagnolli**, J. A. Drake, J. M. Tennessen and O. Alter “*SVD Identifies Transcript Length Distribution Functions from DNA Microarray Data and Reveals Evolutionary Forces Globally Affecting GBM Metabolism,*” *Utah Biomedical Engineering Conference* (Salt Lake City, Utah, September 16, 2013), contributed poster.
- ◆ **N. M. Bertagnolli**, J. A. Drake, J. M. Tennessen and O. Alter “*Similarities and Differences between Normal Brain and Glioblastoma Multiforme Uncovered by Singular Value Decomposition of Transcript Size Distributions,*” *Scientific Computing and Imaging (SCI) Institute (SCIx)* (Salt Lake City, Utah, November 13, 2012), contributed poster.
- ◆ **N. M. Bertagnolli**, J. A. Drake, J. M. Tennessen and O. Alter “*Similarities and Differences between Normal Brain and Glioblastoma Multiforme Uncovered by Singular Value Decomposition of Transcript Size Distribution,*” *Utah Biomedical Engineering Conference* (Salt Lake City, Utah, September 16, 2012), Best Poster Award.

HONORS / AWARDS

3M Circle of Technical Excellence and Innovation Division Award 2016

- ◆ Recognizes the leading innovations and accomplishments in the 3M technical community

NSF Graduate Research Fellowship Honorable Mention

- ◆ National Science Foundation four-year fellowship. ~ 10% acceptance rate

TEACHING EXPERIENCE

Rowland Hall High School, Substitute Teacher

- ◆ Taught math and science classes to high school students when needed

University of Utah School of Computing, Teaching Assistant

- ◆ Provided supplemental instruction and wrote homework for the graduate and undergraduate machine learning course

PROFESSIONAL SOCIETY AND TECHNICAL COMMITTEE ACTIVITIES

International Conference on Healthcare Informatics 2017

- ◆ Committee Member and Technical Reviewer Analytics Track

GRANTS

NIH R01DA038466:

June 2018–Mar 2019

- ◆ Title: Enhancing Evidence-based Counseling for Opioid Abuse via Machine Learning Performance-based Feedback
- ◆ Role: NLP Consultant

OPEN SOURCE CONTRIBUTIONS

mxnet-the-straight-dope

- ◆ Improved tutorial quality, edited documentation, and fixed minor bugs

HuggingFace Transformers

- ◆ Fixed Bug in model conversion to ONNX
- ◆ Updated error handling in GPT-2 training to use control flow instead of try catch
- ◆ Implemented ONNX Conversion for SetFit models

Python-lint-plus

- ◆ Added pydocstyle automation to the git action for CI

PROJECTS

Medium Blog

- ◆ <https://medium.com/@nbertagnolli>

Monte-Carlo Retirement Simulator

- ◆ <https://futurefortune.me/>

ChatGPT plagiarism detector fully client side.

- ♦ <https://spotplagiarism.com>

Example application showcasing free app deployments on github pages

- ♦ <https://easydatasciencewebapps.com>