**Antony Van der Mude**

Burlington, MA 01803 908.343.1334 vandermude@acm.org

**Artificial Intelligence Expert**

**Data Science / Machine Learning / Natural Language Processing**

Innovative problem solver with experience in environments ranging from large research labs to small startups. Employed both full-time and as a consultant in a wide range of industries. Deep understanding of computer science theory enabling the development of original solutions to real-world problems. Accomplishments include peer-reviewed papers in genomics, cancer and philosophy.

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| --- | --- |
| **Platforms:** | Databricks | Amazon AWS | Microsoft Azure |
| **Technologies:** | Agile Methodology | Computer Algorithms | Bayesian Statistics | Deep Learning | Ensemble Methods | Explanatory AI | SQL and Oracle Databases | Firmware and UNIX Internals |
| **Languages:** | Python, C, Java, C++, C#, Perl, LISP |
| **Libraries:** | PySpark, Pandas, Scikit-Learn, Tensorflow |

**Professional Experience**

**Humana**, Boston, MA 12/2020 to 3/2024

*Healthcare and Insurance company.*

**Senior Natural Language Processing Data Scientist**

Member of Digital Health and Analytics Department. Applied Natural Language Processing and Machine Learning to analyze customer sales calls and identify improvements in the customer experience. Wrote Azure functions that process analytics, including BERT vector analysis of human resources data and Optical Character Recognition of medical faxes.

* Developed Random Forest classifier that gave an explanation by highlighting relevant phrases.
* Assisted in developing a Convolutional Neural Net using mel frequency cepstral coefficients, that identified emotions such as anger in calls.
* Wrote Databricks application for text classification using BERT, that analyzed custom sales calls. Instead of using large corpus of tagged data, the classifier was built from a handful of example sentences that explained the classification using semantic similarity to relevant sentences.
* Analyzed the corpus of sales calls, answering questions about issues such as which competitors were mentioned, problems with form submission, or re-enrolling terminated plans.

**Signify** (Philips Lighting), Burlington, MA 11/2016 to 10/2020

*Consumer Products & Internet of Things.*

**Data Engineer**

Member of a team that centralized data analytics for the various business units of Philips Lighting into a center of excellence. Responsible for knowledge transfer for a number of projects, such as lighting usage for home and work. Performed data analysis of luminaire sensor data acquisition and processing.

* Developed a product recommender system for Hue lighting products using Bayesian methodology. Enabled system to provide an explanation for its recommendations.
* Performed statistical analysis of failure points for Architectural Lighting division (lighting systems for bridges, stadiums, and buildings, such as the Empire State Building).
* Developed general purpose data structure mapping software that converted layouts of building floors, rooms, sensors, and devices into the company’s standard normalized building data structure. This was the initial setup step of the system to process luminaire data for IoT analysis for each building.

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**Security Scorecard**, New York, NY 9/2015 to 8/2016

*Cybersecurity.*

**Data Analyst**

Member of Data Analysis team. Wrote NLP applications to identify cybersecurity targets and social engineering risks.

* Implemented Named Entity Recognizer to identify company targets in Hacker Chatter, map WhoIs IP addresses and parse data breaches. Achieved less than 2.5% False Positive rate on identification.
* Developed Sentiment Analysis software for Twitter and Reddit to identify possible security problems.
* Defined metrics for risk of social engineering of companies due to unusual use of company emails.
* Used DBSCAN clustering analysis to classify hacker chatter and cluster companies by security risk.

**Knewton**, New York, NY 3/2013 to 7/2015

*Adaptive Educational Software.*

**Senior Software Engineer**

Member of Data Analytics / Dashboards team. Wrote Hadoop ETL programs and machine learning tools.

* Developed machine learning text classifier in Python and C to categorize pages with educational content for possible inclusion into Knewton's educational taxonomy.
* Wrote jobs for Amazon's Elastic Map Reduce to load student interactions from Cassandra to Redshift. This data was used to train the Machine Learning systems for adaptive learning.

**Antony Van der Mude LLC**, Hackettstown, NJ 1/2005 to 3/2013

*Computer Consulting.*

**President**

Developed applications for Military, Medical and Consumer products. Defined project requirements, Statements of Work, schedules, and budgets. Developed algorithms and software for device firmware and supporting tools, authored and ran acceptance tests, and assisted transition to manufacturing.

* Developed test software and statistical analysis reports for infrared camera black body calibration.
* Facilitated $18M in sales for the Navy by completing development and delivering on-schedule software to control a sensorless motor to run an air compressor mounted on the F-16.
* Authored firmware for user interface for Laryngoscope, used to diagnose diseases of the larynx.
* Wrote firmware for a portable Polymerase Chain Reaction (PCR) detector.
* Developed I2C interface to precision timer chip for increased accuracy of the Unix kernel time function.

**AT&T Labs**, Florham Park, NJ 1/1999 to 12/2004

*Research and Development.*

**Member Technical Staff**

Designed and rolled out machine learning Algorithms, analyzed speech recognition accuracy, and delivered speech recognition and text-to-speech solutions for AT&T infrastructure.

* Developed data tuning techniques to bring groundbreaking "How May I Help You" customer service speech recognition from 80% to 98% accuracy by tuning ML models and doing performance analysis.
* Enhanced AT&T network capabilities through key contributions to speech recognition and text-to-speech software, including long-haul switches and local data centers.
* Facilitated successful development of machine learning models supporting outside customers for natural language Understanding applications for AT&T Speech Recognition products.

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**Additional Experience**

**Bell Telephone Labs**, Holmdel NJ, **Member of Technical Staff**

Part of research and development team for maintaining the user experience of the Bell Telephone system. Built speech recognition and artificial intelligence prototypes for new AT&T services and conducted usability studies. Provided advanced computer expertise and capabilities bolstering on-time project completion and performed statistical analysis on studies and data collection tasks.

**Coopers and Lybrand**, New York, NY, **Supervisor**

Developed and maintained Artificial Intelligence software to support audit work. Wrote software for various auditing applications such as audit risk, hospital billing, and income tax. Project leader and lead developer on Machine Learning system for data conversion from financial auditing packages. Documented expert system for tax analysis written in Common LISP that was required for every income tax submission done in the firm.

**Education**

**Master of Science (MS)**, Computer Science Rutgers University, New Brunswick, NJ

**Bachelor of Science (BS)**, Physics, Case Western Reserve University, Cleveland, OH

**Publications / Patents**

* A Proposed Information-based Modality for the Treatment of Cancer Biosystems, Volume 211, January 2022 <https://doi.org/10.1016/j.biosystems.2021.104587>
* Poster presentation given at Cell Journal Symposium on the Hallmarks of Cancer, San Diego 2022.
* Structure Encoding in DNA, Journal of Theoretical Biology, Vol. 492, 7 May 2020, <https://doi.org/10.1016/j.jtbi.2020.110205>
* Causally Active Metaphysical Realism, Quantum Speculations (Supplement to the International Journal of Quantum Foundations), Volume 1, Number 1, October 2019, <https://ijqf.org/archives/5704>
* Patent #8,463,565B1 LED flashlight with battery life indicator, Ralph Osterhout, Michael J. Keating, Antony Van der Mude, <https://patents.google.com/patent/US8463565B1>
* Patents #7,933,766, 7,620,550, 7,295,981, Method for building a natural language understanding model for a spoken dialog system, Narendra Gupta, Mazin Rahim, Gokhan Tur and Antony Van der Mude, <https://patents.google.com/patent/US7933766B2>
* On the Inference of Stochastic Regular Grammars, Information and Control, Volume 38, Issue 3, September 1978, [https://doi.org/10.1016/S0019-9958(78)90106-7](https://doi.org/10.1016/S0019-9958%2878%2990106-7)

**Professional Organizations / Affiliations**

ACM, Association for Computing Machinery

IEEE, Institute for Electrical and Electronic Engineers

AAAI, American Association for Artificial Intelligence