Ilan Reinstein, M.S.

https://www.linkedin.com/in/ireinstein/, https://ilanreinstein.github.io

Summary

Data scientist with over 5 years of experience in leveraging data to improve analytic strategy, understand patterns, generate valuable insights, and design solutions for complex business problems through the use of applied statistics and quantitative modeling across diverse domains, with a particular focus on the education technology sector. Committed to delivering and communicating clean and effective actions using dashboards and data stories to drive impact on relevant business metrics and influence informed decisions to leadership.

Education

Master of Science in Applied Physics, September 2015 - May 2017
New York University Tandon School of Engineering, Brooklyn, NY

Bachelor of Science in Physics, January 2009 - March 2014
Universidad de Los Andes, Bogotá, Colombia

Certifications

Data Engineering - Udacity, July 2021, New York, NY
Data Science for All (DS4A) Colombia - Correlation One, November 2020, New York, NY

Skills

- R, Python, SQL, Linux, git, Docker, Spark, Airflow, Cloud Computing (AWS, GCP)
- Data Science and Machine Learning; NLP; Statistical Inference and Modeling; Data Engineering

Languages

English (fluent)**; Spanish** (native)

Professional Experience

New York University Grossman School of Medicine, New York, NY
Senior Data Scientist Engineer, March 2021 – Present

- Developing and maintaining end-to-end data pipelines for a NLP framework using clinical notes of medicine residents as an instrumentation for note writing quality. Deploy predictions via dashboard to help faculty make recommendations that improve clinical note taking education for students.
- Developed R and SQL pipelines into an R Shiny dashboard to automate grading, analysis, and reporting of Clinical Simulations data. Responsible for driving product strategy and development by collaborating with non-technical domain experts.
- Developed end-to-end reporting pipeline and dimensional model for 148 medical schools, combining data from 10+ publicly available datasets on providers to track KPIs on physician outcomes at the national level.
- Built, deployed, and evaluated a machine learning model to improve efficacy of the admissions workflow, reducing application review time by over 70% and collaborating with admissions stakeholders to improve diversity and reduce human biases.
- Integrated instrumentation for measurement of students' learning and defined bespoke KPIs to identify patterns in responses on chest X-rays and other imaging.

Associate Research/Data Scientist, April 2018 – February 2021

- Designed and deployed a machine learning model to monitor students' performance KPIs and identify key risk factors.
- Analyzed data from three experiments measuring longitudinal learning during deliberate practice of visual diagnosis, identifying behavioral patterns of students and generating personalized predictions and recommendations for practice to each participant.
- Built instrumentation for real-time analysis of subject's responses from an emergency room imaging simulator, providing feedback on performance and recommending new practice examples for Adaptive Learning Algorithm for Teaching.
- Collaborated with a team to develop a machine learning model for determining favorable outcomes in admitted COVID-19 patients, leading to the successful discharge of 17k+ patients.

KDnuggets, Brooklyn, NY
Contributing Editor, September 2017 – February 2018

- Authored, edited, and published original articles about educational resources on advanced algorithms and current trends, products, and discoveries in Big Data, Analytics, and AI.
- Recognized for five Most Read articles on the site.

Inter-American Development Bank (IADB), New York, NY
Data Visualization Consultant, August 2017 – February 2018

- Developed and designed an ETL pipeline with publicly available data on Latin America's usage of renewable energy to build an interactive visualization product.

- Drove recommendations on impactful policies in the region and enhanced outreach and communication to business domain experts about sustainable energy initiatives.

Bayesquare Foundation, New York, NY
Machine Learning Research Assistant, July 2017 – October 2017
- Collaborated with a team of junior data scientists to develop and apply machine learning models to financial and economic data, exploring intelligent approaches to economic policy such as interest rate decisions.
- Analyzed and implemented a statistical model capable of identifying relevant risk factors that drive crime in large cities across the US.

Urban Observatory, Center for Urban Science + Progress, Brooklyn, New York University, NY
Research Assistant, February 2017 – June 2017
- Collaborated with a team of research scientists to develop a data processing and cleaning pipeline for analysis and feature extraction from a dataset of 70k images for the detection of smoke and vapor emissions from buildings across the NYC skyline.

Aentrópico, Bogotá, Colombia
Data Science Intern, April 2014 – November 2014
- Developed, designed, and integrated data products for visualization and analysis into the company's API.
- Used and applied the company's product to publish relevant data stories to improve outreach to new customers.

Publications

Peer-Reviewed Publications

Schaye, V., Guzman, B., Burk-Rafel, J., Marin, M., **Reinstein, I.,** *et al.* Development and Validation of a Machine Learning Model for Automated Assessment of Resident Clinical Reasoning Documentation. *J GEN INTERN MED* **37**, 2230–2238 (2022). https://doi.org/10.1007/s11606-022-07526-0

Burk-Rafel, Jesse MD, MRes; **Reinstein, Ilan MS**; Park, Yoon Soo PhD. Identifying Meaningful Patterns of Internal Medicine Clerkship Grading Distributions: Application of Data Science Techniques Across 135 U.S. Medical Schools. Academic Medicine ():10.1097/ACM.0000000000005044, October 25, 2022. | DOI: 10.1097/ACM.0000000000005044

Burk-Rafel, Jesse MD, MRes; **Reinstein, Ilan MS**; Park, Yoon Soo PhD. Toward (More) Valid Comparison of Residency Applicants' Grades: Cluster Analysis of Clerkship Grade Distributions Across 135 U.S. MD-granting Medical Schools. Academic Medicine 97(11S):p S156, November 2022. | DOI: 10.1097/ACM.0000000000004853

Rhee, D.W., **Reinstein, I.,** Jrada, M. *et al.* Mapping hospital daa to characterize residents; educational experiences. *BMC Med Educ* 22, 496 (2022)

Burk-Rafel J, **Reinstein I,** Satyamoorthi N, Marin M. AMA Accelerating Change in Medical Education Graduate Profile: Workforce, Practice, and Quality Metrics for Graduates from ACE UME Institutions from 1981-2016. December 2021

Burk-Rafel J, **Reinstein I,** Feng J, Kim M, Miller L, Cocks P, Marin M, Aphinyanaphongs Y. Development and Validation of a Machine-Learning-Based Decision Support Tool for Residency Applicant Screening and Review, *Academic Medicine: August 3, 2021 - Volume - Issue - doi: 10.1097/ACM.0000000000004317*

Reinstein I, Hill J, Cook D.A. *et al.* Multi-level longitudinal learning curve regression models integrated with item difficulty metrics for deliberate practice of visual diagnosis: groundwork for adaptive learning. *Adv in Health Sci Educ* (2021). https://doi.org/10.1007/s10459-021-10027-0

Razavian N, Major V, Sudarshan M, Burk-Rafel J, Stella P, Randhawa H, Bilaloglu S, Chen J, Nguy V, Wang W, Zhang H, **Reinstein I**, Kudlowitz D, Zenger C, Cao M, Zhang R, Dogra S, Harish K, Bosworth B, Francois F, Horwitz L, Ranganath R, Austrian J, Aphinyanaphongs Y. A Validated, Real-Time Prediction Model for Favorable Outcomes in Hospitalized COVID-19 Patients. *npj Digit. Med.* **3,** 130 (2020). https://doi.org/10.1038/s41746-020-00343-x

Non-Peer Reviewed Publications

Burk-Rafel J and **Reinstein I**, on behalf of the NYU/AMA Data Coordinating Center. AMA Accelerating Change in Medical Education Graduate Profile: Workforce, Practice, and Quality Metrics for Graduates from ACE UME Institutions from 1981-2016. 2021 report.

Schaye V, Kudlowitz D, Guzman B, Miller L, Chun J, **Reinstein I,** Burk-Rafel J, Cocks P, Aphinyanaphongs Y, Marin M. NoteSense: Development of a Machine Learning Algorithm for Feedback on Clinical Reasoning Documentation. Abstract published at Hospital Medicine 2020, Virtual Competition. Abstract 448 Journal of Hospital Medicine. *https://shmabstracts.org/abstract/notesense-development-of-a-machine-learning-algorithm-for-feedback-on-clinical-reasoning-documentation/. July 10th 2020 [Abstract]*

Poster Presentations

Burk-Rafel J, **Reinstein I**, Marin M, Satyamoorthi N, Santen S, Hogan S, Yamazaki K, Holmboe E, Richardson J. Opioid Prescribing Variability Among All Emergency Medicine, Internal Medicine, and Family Medicine Residency Graduates from 2014-2018. ACGME MEaning in MEdicine, Virtual. March 2022

Mahtani A, **Reinstein I**, Marin M, Burk-Rafel J. Towards Holistic Review in Resident Selection: Applying Natural Language Processing to Applicants' Experiences entries. NYU Langone Medical Education Day. New York, NY. November 2021.
Rajagopalan A, **Reinstein I**, Marin M, Burk-Rafel J. Predicting Resident Performance from Residency Application Data. NYU Langone Medical Education Day. New York, NY. November 2021.
Reinstein I, Savadamuthu V, Marin M, Triola M, Gillespie C. Determining Predictors of Success in Medical School. *2020 Information Technology in Academic Medicine Conference. AAMC Group on Information Resources (GIR). [Accepted. Conference Cancelled due to COVID-19]*
Reinstein I, Koscica N, Savadamuthu V, Hardowar K, Wilhite J, Gillespie C. Automated Reporting Platform. *2020 Information Technology in Academic Medicine Conference. AAMC Group on Information Resources (GIR). [Accepted. Conference Cancelled due to COVID-19]*
Burk-Rafel J, **Reinstein I,** Feng J, Kim M, Miller L, Cocks P, Marin M, Aphinyanaphongs Y. Resident Retriever: A Machine Learning Approach to Screening Residency Applicants. AAIM Academic Internal Medicine Week, Virtual. April 2021
Schaye V, Burk-Rafel J, Guzman B, **Reinstein I,** Kudlowitz D, Miller L, Chun J, Marin M, Aphinyanaphongs Y. NoteSense: Development of a Machine Learning Algorithm for Feedback on Clinical Reasoning Documentation. AAIM Academic Internal Medicine Week, Tampa FL. April 2020. [Canceled due to COVID-19]
Schaye V, Burk-Rafel J, Guzman B, **Reinstein I,** Kudlowitz D, Miller L, Chun J, Aphinyanaphongs Y, Marin M. NoteSense: Development of a Machine Learning Algorithm for Feedback on Clinical Reasoning Documentation. Society to Improve Diagnosis in Medicine, Virtual. October 2020.

Oral Presentations

Burk-Rafel J, **Reinstein I**, Marin M, Satyamoorthi N, Santen S, Hogan S, Yamazaki K, Holmboe E, Richardson J. Opioid Prescribing Variability Among All Emergency Medicine, Internal Medicine, and Family Medicine Residency Graduates from 2014-2018. ACGME Annual Educational Conference Virtual. March 2022 [Accepted]
Burk-Rafel J, **Reinstein I,** Feng J, Kim M, Miller L, Cocks P, Marin M, Aphinyanaphongs Y. Development and Validation of a Machine-Learning-Based Decision Support Tool for Residency Applicant Screening and Review [RIME Lecture]. AAMC LEarn Serve Lead Annual Meeting, Virtual. November 2021.
Burk-Rafel J, **Reinstein I,** Marin M, Triola M, Fancher T, Ko M, Mejicano G, Skochelak S, Santen S, Richardson J. The AMA Graduate Profile: Tracking Medical School Graduates Into Practice. AAMC LEarn Serve Lead Annual Meeting, Virtual. November 2021
Burk-Rafel J, **Reinstein I,** Marin M, Aphinyanaphongs Y, Cocks P. Resident Retriever: A Machine Learning Approach to Screening Residency Applicants. AAMC Learn Serve Lead Annual Meeting, Virtual. November 2020.
Burk-Rafel J, **Reinstein I,** Marin M, Aphinyanaphongs Y, Cocks P. Holistic Residency Applicant Screening Using Artificial Intelligence. AMA GME Innovation Summit, Virtual. October 2020.
Burk-Rafel J, **Reinstein I,** Marin M, Aphinyanaphongs Y, Cocks P. Using AI to Screen Medical School and Residency Applicants. AAMC Group on Information Resources Spring Meeting, New York, NY. May 2020 [Cancelled due to COVID-19]
Burk-Rafel J, **Reinstein I,** Marin M, Aphinyanaphongs Y, Cocks P. Resident Retriever: A Machine Learning Approach to Screening Residency Applicants. NYU Langone Medical Education Day, New York, NY. November 2019.

Mentoring, Coaching, & Teaching

Universidad de Los Andes, Physics Department, Bogotá, Colombia
Adjunct Professor, January 2015 – May 2015
Courses: Pre-Physics, Physics 101, Physics 102. Managed and delivered weekly problem-solving sessions to 60 engineering and science students. Reviewed and graded assignments

Universidad de Los Andes, Physics Department, Bogotá, Colombia
Teaching Assistant, January 2011 – Dec 2013
Clinic for Problem Solving in Physics: Supported and helped students from engineering and science with their weekly assignments from intermediate and advanced physics courses

Technical Advisor
Faith Asemota - MS in Biomedical Informatics - How do US vs. International Medical Graduates Prescribe Opioids Among Elderly? Class '22
Aravind Rajagopalan - MS in Biomedical Informatics - Predicting Resident Performance from Residency Application Data. Nov Class '21
Arun Mahtani - MS in Biomedical Informatics - Using Natural Language Processing to Categorize Residency Applicants' Experiences and Enhance a Machine Learning Algorithm for Predicting an Interview Invitation. Class '21
Alisha Gumber - MS in Biomedical Informatics - Evaluating the Contributions of Medical Education Background and Demographics to the Variance in MIPS Score. Class '20
Brian Chang - MS in Biomedical Informatics - Exploring Medical Students' Education Performance in Predicting Length-of-Stay with Machine Learning. Class '20
Erica Chio - MS in Biomedical Informatics - Predicting Medical School Admission Outcomes with Personal Statements and Research Aptitude Scores. Class '20