

Selam Waktola

PhD, Data Scientist
Seattle, WA, USA

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TECHNICAL SKILLS

Programming: Python, SQL, Matlab, C#.

Libraries and Tools: Pandas, Numpy, Scikit-learn, OpenCV, PyTorch, TensorFlow, AWS, SageMaker, Docker, Tableau.

Areas of Expertise: Machine Learning, Deep Learning, Predictive Modeling, NLP, Computer Vision, and Image Processing.

RELEVANT EXPERIENCE

Data Engineering Fellow | Data Science for All

April 2023 – Present

Correlation One, US, Remote

- Led a team of four, designing and implementing a robust ETL pipeline to analyze the impact of PPP loans on lender balance sheets using real-world data science business cases within an AWS environment.
- Participating in a highly selective data engineering fellowship focusing on ETL pipelines and utilizing tools like Python, SQL, BigQuery, Redshift, and Pyspark.

Senior Data Scientist

Sept 2022 – Feb 2023

Mutual of Omaha, US, Remote

- Developed and implemented predictive models, including propensity-to-convert, using Python and SQL, resulting in a high customer conversion rate and ensuring compliance with HIPAA guidelines.
- Conducted market basket analysis to optimize customer lifetime value (CLTV) by leveraging customer information and census data, leading to data-driven customer acquisition and retention strategies that significantly boosted ROI.
- Identified new data science use cases, such as fake image detection and automated claims by applying NLP methods to translate business requirements and execute analytic life cycles, resulting in 2 full-time employees (FTEs) savings.

Research Fellow in AI

July 2021 – July 2022

Johns Hopkins University, Baltimore MD, US

- Developed advanced multi-perspective region-based neural networks using Faster R-CNN and NLP techniques to automate CT vertebrae labeling, achieving an impressive F1 score of over 96%.
- Developed deep learning models for generating super-resolution images by recovering from low-resolution CT scans.
- Enhanced usability of medical records by efficiently cleaning and preprocessing data using Python, ensuring consistency and accuracy, resulting in increased data quality by 14%.

Research Fellow in AI

Feb 2020 – July 2021

The Netherlands Cancer Institute, Amsterdam, Netherlands

- Built deep learning models using Python and PyTorch, combining endoscopic images and EHRs to evaluate therapy response in rectal cancer patients, achieving an AUC score of 86%, equivalent to that of a human expert.
- Led the implementation of machine learning models for personalized cancer treatment using CT/MRI/endoscopic images and co-authored 10+ peer-reviewed articles, sharing valuable insights with interdisciplinary professionals.

Data Scientist

June 2018 – May 2019

Enigma Pattern Inc, Lodz, Poland

- Developed precise object detection and classification models for driverless car systems of thermal and natural images using Python, TensorFlow, and various CNN architectures, including ResNet, MobileNet, and VGGNet.
- Improved overall accuracy by 10% by generating synthetic images using Generative Adversarial Networks (GANs).

Research Assistant

Oct 2016 – May 2018

Lodz University of Technology, Lodz, Poland

- Implemented U-Net and SegNet deep neural network models for CT X-ray data segmentation utilizing Tensorflow with Python, achieving 97% of accuracy.

System Engineer

Jan 2014 – Jan 2016

Infosys BPO, Lodz, Poland

- Automated a business process through the development of web-based applications using C#, ASP.NET, and SQL Server stored procedures, resulting in significant cost savings equivalent to over 2 FTEs.

EDUCATION

- PhD in Computer Science**, Lodz University of Technology, Poland Sept 2013
- Developed 3D image processing algorithms and deep-learning methods to analyze, segment, visualize and extract insights from CT X-ray datasets.
- Master of Science (MSc) in Computer Science**, Lodz University of Technology, Poland May 2013
- Bachelor of Science (BSc) in Computer Science**, Jimma University, Ethiopia June 2009

SELECTED PUBLICATIONS

- (2022) Y Huang, CK Jones, X Zhang, A Johnston, **S Waktola**, N Aygun, T.F. Witham d, A. Bydon d, N Theodore d, P.A. Helm, J.H Siewerdsen, A Uneri, ‘Multi-perspective region-based CNNs for vertebrae labeling in intraoperative long-length images’, *Computer Methods and Programs in Biomedicine* 227, 107222.
- (2022) Zuhir Bodalal, Stefano Trebeschi, Ivar Wamelink, Kevin Groot Lipman, Teresa Bucho, Nick van Dijk, Thierry Boellaard, **Selam Waktola**, and Regina G. H. Beets-Tan. The Future of Artificial Intelligence Applied to Immunotherapy Trials. *Neoadjuvant Immunotherapy Treatment of Localized Genitourinary Cancers. Springer, Cham.* https://doi.org/10.1007/978-3-030-80546-3_20
- (2021) Haak, H.E., Gao, X., Maas, M., **Waktola, S.**, Benson, S., Beets-Tan, R.G.H., Beets, G.L., Leerdam, M. van., and Melenhorst, J. ‘The use of deep learning on endoscopic images to assess the response of rectal cancer after chemoradiation’, *Surgical Endoscopy*. <https://doi.org/10.1007/s00464-021-08685-7>
- (2021) **Waktola, S.**, van der Velden, D., F. Castagnoli, R. Beets-Tan. ‘Interpretable machine learning for predicting stereotactic body radiation therapy early response in liver colorectal cancer metastasis’, *ESGAR 2021 Virtual Congress*.
- (2020) Bos, P. Brekel, M., Gouw, Z., Al-Mamgani, A., **Waktola, S.**, Taghavi, M., Castelijns, J., Aerts, Beets-Tan, R., Jasperse, B., ‘Clinical variables and magnetic resonance imaging-based radiomics predict human papillomavirus status of oropharyngeal cancer’, *Head and Neck journal*. <https://doi.org/10.1002/hed.26505>
- (2020) Bos, P. Brekel, M., Gouw, Z., Al-Mamgani, A., **Waktola, S.**, Taghavi, M., Castelijns, J., Aerts, Beets-Tan, R., Jasperse, B., ‘MRI based radiomics predicts locoregional control after chemoradiation treatment of oropharyngeal cancer’, *Head and Neck Journal*. 43(2), 485-495. <https://doi.org/10.1002/hed.26505>
- (2020) Babout, L., Grudzień, K., **Waktola, S.**, Miśkiewicz, K., Adrien, J., Maire, E., ‘Quantitative analysis of flow dynamics of organic granular materials inside a versatile silo model during time-lapse X-ray tomography experiments’, *Computers and Electronics in Agriculture*, 172, <https://doi.org/10.1016/j.compag.2020.105346>
- (2019) **Waktola, S.**, Grudzień, K., Babout, L. ‘Stagnant zone segmentation with U-net’, *Thirty-Third Conference on Neural Information Processing Systems, NeurIPS, BAI Workshops*, Vancouver Canada.
- (2018) **Waktola, S.**, Grudzień, K., Babout, L. ‘Automatic stagnant zone segmentation using CNN and X-ray tomography of silo discharging process’, *Thirty-Third Conference on Neural Information Processing Systems, NeurIPS, BAI Workshops*, Vancouver Canada.
- (2018) **Waktola, S.**, Bieberle, A., Barthel, F., Bieberle, M., Hampel, M., Grudzień, K., Babout, L., ‘A new data processing approach to study particle motion using ultrafast X-ray tomography scanner: case study of gravitational mass Flow’, *Experiments in Fluids*, 59(4), p. 69. <https://doi.org/10.1007/s00348-018-2523-2>
- (2016) **Waktola, S.**, Bieberle, A., Barthel, F., Bieberle, M., Hampel, M., Grudzień, K., Babout, L. ‘Analysis of granular material behavior during silo discharging process using ultrafast X-ray CT’, *8th World Congress on Industrial Process Tomography*, Iguassu Falls, Brazil.