Godfred Somua – Gyimah, PhD

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Legal Status: US Permanent Resident

Work Experience

MONSANTO COMPANY (acquired by BAYER AG) Saint Louis, MO

Data Scientist (Monsanto Emerging Leaders in Science Program), *Jan. 2018 to present (1 year)*

- Translating business problems into research questions for exploratory, descriptive, predictive and prescriptive analytics. Developed deep learning models for seed vigor prediction with ~99.6% sensitivity and ~90.1% specificity using Python, Keras and CNN. Developed imaging models for seed radicle emergence testing and corn tassel spikelet counting using Tensorflow, CNN and image processing. Developed a dryer setting recommender model for optimizing seed quality using DataRobot, R and the Random Forest algorithm. Provided technical support for pilot phase model deployments. Collaborated with business leaders constantly to update / agree on project goals and expectations. Created visualizations to communicate model results to both technical and non-technical audiences. Documented projects on Github and prepared technical reports.

- As an ELS scholar, I have been involved in formal leadership training, mentorship and coaching. My major leadership task for the first 18 months is to co-ordinate the company's cross-functional Data Science teams integration initiative, which aims at achieving cross-team collaboration and similar common best practices across all Data Science teams in the R&D organization.

INSIGHT DATA SCIENCE Manhattan, NY

Artificial Intelligence Fellow (Computer Vision / Deep Learning), *July 2017 – Oct. 2017 (4 months)*

- Implemented the 3D CNN action recognition model by Schindler et al. (2008) using Python, Keras and the KTH video dataset; Modified and improved the model to accommodate more complex actions for real-time video surveillance, while achieving state-of-the-art performance (88% accuracy and 100% recall on the target class for tested videos).

MISSOURI S & T Rolla, MO

Doctoral Researcher (Numerical Modeling, Computer Vision & Machine Learning)*, Aug. 2014 – Dec. 2018 (4 years)*

- Developed and validated a novel method for calibrating the geomechanical parameters of Discrete Element Models using R and the XGBoost machine learning algorithm. The method combines numerical simulation of tri-axial rock testing with XGBoost to achieve prediction accuracies of up to 95.54%.
- Developed and validated a 3D numerical model for studying the failure patterns of geomaterials during rock excavations.

HUAWEI TECHNOLOGIES Accra, Ghana

Data Analyst / Analytics Manager, *Jul 2010 – Sep 2013 (3 years)*

- Provided formal mentoring and leadership to a team of 5 analysts. Performed and led costumer analytics studies. Produced exploratory, descriptive and predictive analyses for revenue forecasting, customer segmentation, customer churn and customer sentiment analyses. Interfaced with clients and created visualizations to communicate analyses / recommendations. Presented and explained technical recommendations to both technical and non-technical audiences.

Education

MISSOURI UNIVERSITY OF SCIENCE & TECHNOLOGY Rolla, MO

- ***PhD Mining Engineering*** *(GPA: 4.0 / 4.0)* Aug. 2014 – Dec. 2018
- ***Graduate Certificate, Business Analytics & Data Science*** *(GPA: 4.0 / 4.0)* Aug. 2016 - May 2017
  (Courses: Machine Learning, Data Visualization, Text Mining, Business Analytics & Data Science)
- ***MS Mining Engineering*** *(GPA: 4.0 / 4.0)* Aug. 2014 - July 2016

UNIVERSITY OF LEEDS Leeds, England

- ***MS Engineering Geology*** Sep. 2013 – Aug. 2014

KWAME NKRUMAH UNIVERSITY OF SCIENCE & TECHNOLOGY Kumasi, Ghana

- ***BS Civil Engineering*** Aug. 2006 - June 2010

Technical Skills

- ***Languages*:** Python, R, SQL, Matlab
- ***Statistics, Machine Learning & Deep Learning*:** Tensorflow, Keras, Scikit-Learn, Caret, Weka, Azure ML, Amazon ML, DataRobot, NLTK, NumPy, SciPy, SAS Enterprise Miner, RStudio, H2O
- ***Data Wrangling & Storage*:** MySQL, Pandas, R Dataframe, Trifacta, HDFS, Hive
- ***Data Visualization*:** Tableau, Power BI, ggplot2, matplotlib
- ***Cloud & Cluster Computing:*** AWS, MS Azure, Domino, Paperspace, Hadoop ecosystem, Apache Spark
- ***Other skills:*** Jupyter Notebook, Git, Flask, Docker

Profile Summary (based on advertised role requirements)

- PhD with 5 years research experience in Machine Learning and Computer Vision.
- Diverse engineering background with 8 years experience in data analytics.
- Experience building machine learning models in Python and R.
- Experience working in Linux, OS X, Windows, Cloud and in High Performance Computing environments.
- Experience solving problems using the following techniques: Regression, Support Vector Machines, Decision trees, Random Forest, Boosting algorithms, Ensembles, KMeans, Mini-Batch KMeans, Agglomerative Clustering, Neural Networks, etc.
- Experience performing analytics on a wide array of datasets (numerical, text, images, videos, structured, unstructured)
- Experience using MySQL and Amazon S3 for data management.

Publications

Journal Articles

- **Somua-Gyimah, G**., et al., A machine learning approach to Distinct Element Model calibration for earth material. International Journal of Constructive Research in Civil Engineering. 2019. In Press.
- **Somua-Gyimah, G**., et al., Formation fragmentation modeling and impact on dragline excavation performance in surface mining operations. International Journal of Mining Science, 2019. Volume 5, Issue 1: p. 11-21. [PDF]
- **Somua-Gyimah, G**., et al., A Material Flow Model for Dragline Bucket-Formation Failure Analyses Using the Distinct Element Method. International Journal of Mining Engineering and Technology, 2018. 1(1): p. 1-15. [PDF]

Theses & Dissertations

- **Somua-Gyimah, G.** Dragline Excavation Simulation, Real-Time Terrain Recognition and Object Detection. PhD Dissertation. Missouri University of Science & Technology. 2018. [PDF]
- **Somua-Gyimah, G.** Finite Element Modeling of The Proposed Tunnel for the York Potash Mineral Transport System. MSc Thesis. University of Leeds. 2014. [PDF]

Peer-reviewed conference papers

- **Somua-Gyimah, G**., et al., A computer vision system for terrain recognition and object detection tasks in mining and construction environments. Proceedings of the 2019 Annual Conference of the Society for Mining, Metallurgy & Exploration (SME). 2019. In Press. [Preprint - PDF]
- Nyaaba W, Frimpong S, **Somua-Gyimah G**, Galecki G. Finite Element Analyses Prediction of Off-Road Tire Temperature Distribution. Science in the Age of Experience. 2016. [PDF]