

# Godfred Somua – Gyimah, PhD

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Legal Status: US Permanent Resident

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## Work Experience

### MONSANTO COMPANY (acquired by BAYER AG)

Saint Louis, MO

*Research Data Scientist (Monsanto Emerging Leaders in Science Program), January 2018 to present (2+ years)*

- Translating business problems into research questions for exploratory, descriptive, predictive and prescriptive analytics.
- 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.
- Developed a three-stage model for automating weed control ratings in herbicide trial fields by combining UAV image processing, Mask R-CNN semantic segmentation and XGBoost regression.
- Developed a dryer recommender model for optimizing seed quality using Random Forest.
- Developed a Logistic Regression model for predicting the failure of dryer fan engines in seed production.
- Developed deep learning imaging models for seed vigor prediction with ~99.6% sensitivity and ~90.1% specificity using Python, Keras and CNN. Developed seed clustering insights using the K-Means algorithm in Jupyter Notebook.
- Performed model deployments and model performance monitoring.
- Prepared technical reports and documented projects on Github and Electronic Lab Notebook (ELN).
- Coach, guide and manage projects of junior data scientists.

### INSIGHT DATA SCIENCE

Manhattan, NY

*Artificial Intelligence Fellow, July 2017 – October 2017 (4 months)*

- Developed RNN models for NLP tasks such as named entity recognition and sentiment analyses using Tensorflow.
- Implemented the 3D CNN action recognition model by [Schindler et al. \(2008\)](#) using Python and Keras.

### MISSOURI UNIVERSITY OF SCIENCE & TECHNOLOGY

Rolla, MO

*Doctoral Researcher (Problem-solving, Machine Learning & Analytics), August 2014 – June 2018 (4 years)*

- Developed and validated a novel method for calibrating DEM parameters using the XGBoost Machine Learning algorithm. The method combines simulation of tri-axial rock testing with XGBoost to achieve prediction accuracies of up to 95.54%.
- Developed a deep learning model for machine vision in mining and construction environments using Single Shot Detection and the Tensorflow object detection API. The model achieved over 90% performance upon pilot phase testing.
- Developed and validated a 3D numerical model for studying the failure patterns of geomaterials during rock excavations.

### HUAWEI TECHNOLOGIES

Accra, Ghana

*Engineering Analyst / Costumer Analytics Manager, May 2010 – September 2013 (3.5 years)*

- Provided formal mentoring and leadership to a team of 5 analysts. Led exploratory, descriptive and predictive costumer analytics studies to discover insights and opportunities. Led end-to-end analytic projects for revenue forecasting, customer segmentation, customer churn and sentiment analyses. Made presentations to technical and non-technical audiences.
- Partnered with internal clients to provide business intelligence / insights from customer data on telecom products. Produced exploratory and descriptive analytics for customer segmentation, sales promotion and targeted marketing. Interfaced with clients and created visualizations to communicate analyses / recommendations.

## Education

### MISSOURI UNIVERSITY OF SCIENCE & TECHNOLOGY

Rolla, MO

- **PhD Mining Engineering** (GPA: 4.0 / 4.0)
- **Graduate Certificate, Business Analytics & Data Science** (GPA: 4.0 / 4.0)

Aug. 2014 – June 2018

Aug. 2016 - May 2017

(Courses: Data Mining & 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 (Analytics Tools)

- **Languages:** Python, R, SQL, NoSQL, Matlab
- **Statistics, Machine Learning & Deep Learning:** Tensorflow, Keras, Scikit-Learn, Caret, Weka, Azure ML, Amazon ML, DataRobot, NLTK, NumPy, SciPy, SAS Text Miner, RStudio, H2O
- **Data Wrangling & Storage:** MySQL, Apache Hive, Pandas, R Dataframe, Trifacta, MongoDB, Cassandra, HDFS
- **Data Visualization:** Tableau, Power BI, ggplot2, matplotlib
- **Cloud Computing:** AWS, GCP, MS Azure, Domino, Paperspace
- **Other skills:** Jupyter, Git (github, bitbucket), Flask, Docker, Kubernetes, Apache Hadoop, Apache Spark, JIRA, Trello

## First Author Publications

- **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. [\[PDF\]](#)
- **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. [\[PDF\]](#)
- **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. [\[Preprint - PDF\]](#)