Clement Essandor Ampong

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Education

Master of Science in Mathematics

Geogia State University (GSU)   *August 2023 - Present*

GPA: 4.00/ 4.30

Bachelor of Science in Mathematics

University of Cape coast (UCC)   *August 2018 - November 2022*

GPA: 3.43/ 4.00 (second class upper division)

Relevant Coursework

Data Analysis I, SAS Programming, Partial Differential Equations, Numerical Analysis, Applied Matrix Algebra, Advance Calculus I & II, Complex Analysis, Programming and Problem Analysis I, Optimization, Mathematical Biology

Research Interests

Application of Optimization in Machine Learning, Partial Differential Equations, Numerical Analysis, and Mathematical Modelling

Skills and Interest

○ SAS Programming
○ R Studio
○ Matlab
○ Python
○ C++: basic programming skills in C++
○ SPSS: Effective data analysis using SPSS
○ Microsoft office application: Excel, Microsoft Word, PowerPoint, and Outlook.
○ Understanding of how to formulate and solve optimization problems
○ Ability to communicate effectively

Interests: Observation and Research, Consulting, Music, Photography and Traveling.

Hobbies: Soccer, Reading

Undergraduate Project

Project Work   *August 2022 - November 2022*

Project Topic:: Application of Linear Programming in Profit Maximization of Asanduff Construction

Advisor:: Henry Amankwah (PhD.)

Summry:: Linear programming technique was used to formulate a model that ensures maximum profit for Asanduff Construction. Data obtained from Asanduff Construction was modeled and solved using EXCEL SOLVER software. The daily profit of the company was increased by approximately 27.1% as a result of employing Linear Programing in determining the company's profit maximization. Findings of the project also drew attention of businesses that using Linear Programming technique to determine profit maximization would be more beneficial than doing it otherwise.

Duties:: Formulated the project hypothesis, read relevant literature, performed mathematical calculations, presented findings and recommendations.

Experience

Department of Mathematics and Statistics, GSU   *August 2023 - Present*

Graduate Teaching Assistant:

- Provide immediate assistance to students taking College Algebra, Support for College Algebra, and Pre-calculus by assisting them to understand their coursework, homework assignments and quizzes effectively.
- Lead Breakout sessions and review sessions for college algebra to reinforce learning objectives and clarify doubts.
- Grade quizzes and exams for Calculus 1, manage and update student grades on an online grade book.
- Provide additional support to students outside of class hours, addressing questions and offering guidance on course material.

College of Distance Education, UCC   *November 2022 – July 2023*

National Service Person: Quality Assurance and Enhancement Unit

- Monitor all the activities of the college and offer feedback and recommendation to management for decision making.
- Design monitoring and evaluation instruments that suit the activities of the college.
- Evaluate and appraise face-to-face tutorials, course facilitator, quizzes, end of semester examination, matriculation and congregation ceremonies, transportation, module distribution, online portal and quality of modules.
- Generate report on appraisal of course tutors for the college.
- Organize seminars.
- Recommend new programmes to management, to be conducted via distance mode.
- Responsible for overseeing the marking, ticking, checking and recording of scripts for face-to-face tutorials, quizzes, end of semester examination, and conference marking, ensuring that quality standards are met in dispensing these activities.

CADS Contracts and Service Ltd, Accra, Ghana   *October 2021 - December 2021*

Internship Student: Attendance Specialist

- Performed clerical duties pertaining to all aspects of the company's attendance management system.
- Monitored and documented all attendance related Site communication.
- Responded to attendance inquiries which may require data review.
- Prepared and input daily and summary reports regarding Site attendance and enrollment.
- Assisted in the preparation and distribution of correspondence and reports regarding excessive staff absences, which may contain sensitive and confidential information.
- Operated a computer and related software to input staff absence data and extract output reports as needed by staff and agency personnel.

Shai-Osudoku District Hospital, Accra, Ghana   *December 2020- January 2021*

Internship Student: Health Insurance Data Entry Clerk

- Compiled, modeled and reported on data for staff members as directed.
- Receive, process and pay claims for service rendered by health providers.
- Help in the public education on health insurance.
- Ensured the efficiency and quality of service under the national health insurance scheme.

Private Mathematics Tutor   *February 2020 - November 2020*

- o Tutor a group of 20 junior high school and senior high school students on elective Mathematics and core Mathematics.
- o Organized and graded quizzes to evaluate the students' comprehension.
- o Prepare the students' for their upcoming exams, Basic Education certification Examination (BECE), and SAT.
- o Offered an assistance to students who need help in Linear Algebra I and II, Operations Research, and Optimization so they can have a stronger base for comprehension.

Academic Projects

Math Modelong Of Epidemiology:

Forecasting Influenza Dynamics in the US   *December 2024*

- o Developed predictive models to forecast influenza epidemics in the United States using the n-sub epidemic model and the STAT MOD PREDICT toolbox.
- o Evaluated the performance of various forecasting approaches to provide accurate and timely predictions of influenza dynamics.
- o Supported public health planning by identifying patterns and trends in disease spread to inform intervention strategies.

Parameter Estimation and Forecasting Using ODE Models   *October 2024*

- o Estimated model parameters and forecasted the spread of the 1918 influenza pandemic in San Francisco using ordinary differential equations (ODEs) and the QuantDiffForecast MATLAB toolbox.
- o Successfully generated forecasts with quantified uncertainty and assessed the performance of Nonlinear Least Squares (NLS) and Maximum Likelihood Estimation (MLE) methods in parameterizing a Susceptible-Exposed-Infectious-Recovered (SEIR) model.

Fitting and Forecasting Epidemic Data Using StatModPredict   *October 2024*

- o Explored the StatModPredict R-Shiny dashboard to visualize and generate forecasts using COVID-19 data.
- o Gained insights into model selection and performance evaluation, refining the forecasting approach through analysis.

Forecasting Growth Trajectories Using Phenomenological Growth Models   *October 2024*

- o Utilized the QuantDiffForecast toolbox to fit and forecast time-series data of daily monkeypox cases in the USA using phenomenological growth models.
- o Gained practical experience in model fitting and evaluation, enhancing forecasting performance and understanding of time-series analysis.

Extension of the SEIR Model   *September 2024*

- o Designed and analyzed two extended SEIR models incorporating a mildly symptomatic class and a hospitalized class to better represent disease transmission dynamics.
- o Improved the model's ability to simulate the transmission characteristics of infectious diseases with varying levels of infectiousness.

Matimathecal biology:

Selection in a Population of Three Phenotypes   *October 2024*

- o Examined the effects of selection in a population of moths with three distinct phenotypes based on genotype.
- o Provided insights into how genetic variations influence population dynamics and the implications of selection on phenotype prevalence.

SAS Programming and Data analysis:

Effectiveness of Chelation Treatment with Succimer on Blood Lead Levels in Children   *April 2024*

- o Created a SAS model to analyzes the blood lead levels of children over time to assess the impact of two

treatment groups (Succimer and Placebo).

Numerical Analysis:

Methods for Initial Value Problems   *February 2024*

○ Developed a Matlab model that implement time stepping methods for initial value problems with three different methods (Euler's method, the fourth order Runge-Kutta method, and the fourth order Adams-Bashforth method)
○ The model assess the order of the approximation and compare the empirical results to the theoretical error results.

Direct and Iterative Methods for Solving a Linear System   *March 2024*

○ Implemented a Matlab model to compare the accuracy of the Cholesky factorization method and the Gauss-Seidel iterative method for solving a linear system of the form $Ax = b$.
○ The model assess the accuracy of the methods by comparing residuals of the different methods.

Direct and Iterative method to solve two point boundary value problems.   *April 2024*

○ Developed a Matlab model to apply the conjugate gradient method to solve two point boundary value problems.
○ The model compare the results of the algorithm when used as a direct method and as an iterative method.

Optimization:

Using Steepest Descent Algorithm to approximate exponential data   *February 2024*

○ Implemented a Matlab model to apply the Steepest Descent Algorithm to approximate exponential data of the form $y(t) = Ae^{at}$ of a population growth.
○ The algorithm predicted the next 5 data points of the dataset in the next five years.

Using Gauss-Newton Algorithm to solve Optimization Problem   *March 2024*

○ Developed a Matlab model to apply the Gauss-Newton Algorithm to solve Optimization Problem of the form $y = Ae^{\gamma t}\sin(kt + a)$.
○ The algorithm predicted the next 5 data points of the dataset.

Maximizing a Quadratic Objective Function with Equality Constraint   *April 2024*

○ Implemented a Matlab model to solve a linear programming problem using the Lagrangian Algorithm.

Conference and Seminars

○ Georgia Statistics Day 2024. **Held at Emory University, October 2024**
○ 2023 Field of Dreams Conference. **Held at Georgia State University, November 3-5, 2023**
○ Optimal Control of a Multi-scale HIV-Opioid Model. **Virtual Math & Stat Colloquium. November 17, 2023.**
○ A Statistical Framework for design and Analysis of Spatial Transcriptomics Experiments. **Virtual Math & Stat Colloquium. November 15, 2023.**

Honours

MATHS & STATS ALUMNI AWARD (UCC)   *March 2023*

Designated as the best male student in BSc Mathematics who demonstrated strong academic excellence and leadership.

EZZARD SCHOLARSHIP (GSU)   *September 2023*

Scholarship offered to deserving students enrolled at GSU who have exhibited exceptional academic achievements.