TAEHYEONG KIM

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EDUCATION

PH. D. in Mathematics 2020. 3 - 2024. 2†
Pusan National University, Busan, Korea.

Master of Science in Mathematics 2018. 3 - 2020. 2
Pusan National University, Busan, Korea.

Bachelor of Science in Mathematics 2011. 3 - 2017. 8
University of Ulsan, Ulsan, Korea.

SKILLS AND INTERESTS

Research Interests Scientific computing, Mathematical modeling, Numerical mathematics, Data analysis, Nonlinear matrix equation, Iterative methods, Optimization problem.

Programming MATLAB

Python

Platforms MS Office

WORK EXPERIENCE

Matlab Student Ambassador 2020. 3 - 2022. 2
MathWorks

· Promoted MATLAB to students of Pusan National University.
· Ran the MATLAB Facebook community & Instargram.
· Hosted the MATLAB event for students at Pusan National University more than twice every semester.

BOOK TRANSLATION

· Linear Algebra and Learning from Data by. Gilbert Strang (Author) 2020. 2 - 2020. 8
- Translator and inspector.
- Translation from English to Korean.

EDUCATION

· K-MOOC TA for Linear Algebra and Learning from Data 2021. 3 - 2021. 6
- Subject : Linear Algebra and Learning from Data
- Review videos and captions weekly.
- Make a quiz, midterms, and final exams.
- Answer students' questions.

· Development of a mathematics program centered on experiential exploration to strengthen the competency of scientific talent 2020.12 - 2021. 4
- Make videos of AI and machine learning.
- Make program for computing overlapping area of two ellipses.
- Participated in the compliation of textbooks for students.

· Python class for middle school & high school students 2020. 9 - 2020.11
- data preprocessing with `pandas` and `numpy`.
- visualization with `matplotlib` and `seaborn`.
- fundamentals of machine learning.

· K-MOOC TA for Numerical Analysis 2018. 9 - 2018.12, 2019. 9 - 2019.12, 2020. 9 - 2020.12
- Subject : Numerical Analysis
- Review videos and captions weekly.
- Make a quiz, midterms, and final exams.
- Answer students' questions.

PROJECTS

Numerical Methods for Solving Matrix Equations 2018. 3 - Ongoing
Major Project

- On Newton's Method for Solving a System of Nonlinear Matrix Equations.
- On Direct Newton's Method for Solving a System of Nonlinear Matrix Equations
- Efficient Method for Solving the System of Nonlinear Matrix Equations
- Natural Language Processing Algorithms for Solving Generalized Linear Matrix Equation(Draft)
- Time-varying matrix equation and Zhang Neural Network and Kalman Filter
- Matrix Determinant and Tensor Rank (method : LASSO)

Projects Related to Industrial Mathematics 2018. 3 - Ongoing
Minor Project

- Development of an algorithm improving label arrangements in offset printing
- Development of algorithm for calculating the area of two ellipses according to rotation and translation
- A correlation analysis between infection in wild birds and in poultry farms
- An optimal route recommendation system for ships based on A* algorithm
- Neural Mechanism Mimetic Selective Electronic Nose based on Programmed M13 Bacteriophage
- Development of an algorithm for determining osteoporosis using image processing
- A Deep learning approach determining early glaucoma patients
- An Efficient Resolution of Label Printing Problem
- Development of Fundus Identification Algorithm Using Kaggle Data

PUBLICATION

Published

1. [SCIE] Jong-Min Lee,Vasanthan Devaraj, Na-Na Jeong, Yujin Lee, Ye-Ji Kim, **Taehyeong Kim**, Seung Heon Yi, Won-Geun Kim, Eun Jung Choi, Hyun-Min Kim†, Chulhun L.Chang†, Chuanbin Mao†, and Jin-Woo Oh†, "Neural Mechanism Mimetic Selective Electronic Nose based on Programmed M13 Bacteriophage", Biosensors and Bioelectronics(SCIE : 12.54), (2022. 1)
2. [KCI] **Taehyeong Kim**, Sang-Hyup Seo, and Hyun-Min Kim†. "On Newton's Method for Solving a System of Nonlinear Matrix Equations", East Asian mathematical journal 35.3: 341-349. (2019)

Book chapter

1. Geun Soo Jang, **Taehyeong Kim**, Hyun-Min Kim, Ki Man Kong, Jeong Rye Park, Jong-Hyeon Seo, Sang-Hyup Seo†, and Shin Won Yoon, "Development of an Algorithm Improving Label Arrangements in Offset Printing", Proceedings of the Forum "Math-for-Industry" 2019 (2022. 9)

Submitted

1. [SCIE] Hwayeong Kim, Jiwoong Lee, Sangwoo Moon, Sangil Kim, **Taehyeong Kim**, Sang Wook Jin, Jung Lim Kim, Jonghoon Shin, Seung Uk Lee, Geunsoo Jang, Yuanmeng Hu, Jeong Rye Park†, "Visual Field Prediction using a Deep Bidirectional Gated Recurrent Unit Network Model", Scientific Report (SCIE : 4.996) (submit : 2022. 7)
2. [SCIE] Jeong Rye Park, Sangil Kim, **Taehyeong Kim**, Sang Wook Jin, Jung Lim Kim, Jonghoon Shin, Seung Uk Lee, Geunsoo Jang, Yuanmeng Hu, Ji Woong Lee†, "Data preprocessing and augmentation improved visual field prediction of recurrent neural network with multi-central datasets", Ophthalmic Research (SCIE : 3.031) (submit : 2022. 3)

In preparation

- **Time-varying matrix equation Zhang Neural Network and Kalman Filter** 2023. 1
- **Matrix Determinant and Tensor Rank (method : LASSO)** 2023. 1
- **Monotony of a Modified Newton's Method for Solving a Matrix Polynomial Equation** 2022. 9

· Weight matrix analysis of Flow based Generative Model 2022. 8
· Development of tensor-based indicators for artificial neural network meta-analysis 2022. 4
· Invisible Audio-into-Image Hiding with key-based Cryptography 2022. 2
· Monotony of a Modified Newton's Method for Solving a Quadratic Matrix Equation 2021.12
· Solving Time Varying Matrix Equation by Using Zhang Neural Network 2021. 7
· Advances in Audio Watermarking Based on Nonnegative Matrix Factorization 2021. 7
· Korean Document Clustering by Topic Using Matrix Factorizations 2021. 6
· Development of Fundus Identification Algorithm Using Kaggle Data 2021. 3
· Natural Language Processing Algorithms for Solving Generalized Linear Matrix Equation 2020.12
· Efficient method for Solving the System of Nonlinear Matrix Equations Based on CR reduction 2019. 6
· On Direct Newton's Method for Solving a System of Nonlinear Matrix Equations 2019. 6

CONFERENCE

Oral presentation

· Sakura Program 2022. 8
Introduction to Zhang Neural Network and Solving Time-varying Matrix Equations
· Matrix Equations and Tensor Techniques IX (METTIX) 2021.10
Method for the Minimal Positive Solution of a System of Multi-Variable Nonlinear Matrix Equations
· 2020 KMS Annual Meeting 2020.10
Development of osteoporosis indicators using texture analysis for DEXA images of mice
· The 9th International Congress on Industrial and Applied Mathematics (ICIAM) 2019. 7
An optimal route recommendation system for ships based on A* algorithm
· 2019 Annual Conference of Korean Society for Mathematical Biology 2019. 6
An optimal route recommendation system for ships based on A* algorithm

Poster presentation

· 2022 KSIAM Annual Meeting 2022.11
Zhang Neural Network for solving Time-varying Matrix Equations
· 2022 KMS Spring Meeting 2022. 4
Monotony of a modified Newton's method for solving a unilateral quadratic matrix equation
· KSIAM 2021 Spring Conference 2021. 6
Korean Document Clustering by Topic Using Matrix Factorizations
· 2020 KMS Annual Meeting 2020.10
Development of osteoporosis indicators using texture analysis for DEXA images of mice