GitHub: <https://github.com/Maximal-K>

Mobile: (+86) 18758376991 | E-mail: [hangq1007@outlook.com](mailto:hangq1007@outlook.com)

362 Jiangnan Yipin, Xinming Street, Ningbo, Zhejiang, China 315042

**Education**

**Zhejiang University of Science and Technology** (ZUST) 09/2020 - 06/2024

**Bachelor of Communication Engineering** GPA: 3.85/5 Hangzhou, China

*Relevant Courses*: Electronic Circuit, Digital Pulse Circuits, High Frequency Electronic Circuits, Fundamentals of Electromagnetics, Data Communication and Computer Networks, Signals and Systems, Digital Signal Processing, Communications Signal Processing Based on MATLAB, Microprocessor and Its Applications, Embedded Systems, Communication Principles, Wireless Communication, Information Theory and Coding, Network Routing and Switching Technology, Wireless Network Planning and Optimization, Data Structure, Principles and Application of Database, C++ Programming, C Language, Machine Learning and Deep Learning.

**Publication**

*Zheng, H. D. (Zheng, Hang-Dan); Wu, M. W. (Wu, Ming-Wei);* ***Qiu, H. (Qiu, Hang)****; Kam, P. Y. (Kam, Pooi-Yuen).* **“New Upper Bounds on the Gaussian Q-Function via Jensen’s Inequality and Integration by Parts, and Applications in Symbol Error Probability Analysis.”** Electronics Letters, vol. 59, no. 21, e12997, Nov. 2023, DOI:10.1049/ell2.12997.

**Research Experience**

**Research on Text Classification Algorithms Based on Transformer Models** 12/2023 - 06/2024

Supervisor: Prof. Lijuan Zhang Hangzhou, China

* This project utilized the Transformer model, trained on a vast amount of labeled text data, enabling the model to automatically classify various types of text.
* Set up the environment, developed the algorithm, and downloaded the pre-trained language model T5-small from the Hugging Face website for use in the experiment.
* Trained the model on large labeled datasets to automatically classify test datasets into ten categories, demonstrating the accuracy and scalability of the algorithm.
* Numerous experiments showed that the algorithm achieved promising results in text classification and has significant development potential and research value.

**Research on Upper and Lower Bounds of the Gaussian Q-Function and Its Applications** 05/2021 - 11/2023

Instructor: Mingwei Wu (C1-515 Laboratory) Hangzhou, China

* The purpose of this study was to improve the accuracy and quality of Gaussian Q-function results in the performance analysis of communication systems.
* Verified the derivation of the bounds, completed the derivation of their inverse functions, and validated the related figures for the bounds.
* Demonstrated the application of our bounds in analyzing symbol error probabilities across various modulation schemes in communication systems and created and validated related figures for the bounds in different applications.
* A tighter upper bound was obtained as a piecewise function by combining the two upper bounds derived using different approaches. For applications, a closed-form upper bound of the inverse Gaussian Q-function was derived, and several symbol error probability (SEP) expressions for various digital modulation techniques in different channel models were computed to justify the accuracy of the new upper bounds.

**Deriving Bounds for Beckmann Random Variables and Applications in Communication Models**

Instructor: Mingwei Wu (C1-515 Laboratory) 08/2022 - 09/2023

* The Beckmann distribution plays a fundamental role in scientific visualization and is also used to model fading amplitudes in fading channel theory. Due to the integral’s infinite range in its definition, this research aimed to find several bounds and approximations to evaluate them more efficiently.
* Gathered and analyzed relevant papers on the upper and lower bounds of the Beckmann function, deriving all its variations (probability density function and cumulative distribution function).
* Applied methods such as Jensen’s inequality, integration by parts, and the tangent inequality to derive the upper and lower bounds for the Beckmann function, plotted all derived bounds and compared them with results from existing research.
* Reviewed the applications of the Beckmann function in other research papers and applied our derived bounds to those applications.

**Estimation of Upper and Lower Bounds for Non-Invertible Q-Function Using Newton’s Iteration Method**

Instructor: Mingwei Wu (C1-515 Laboratory) 03/2022 - 09/2022

* Conducted literature review and reproduced findings on the Q-function’s upper, lower bounds, and their inverse functions.
* Applied Newton’s iteration method to estimate inverse functions for non-invertible Gaussian upper and lower bound functions.
* Calculated and compared the estimation errors of derived inverse functions across various bounds to evaluate accuracy and reliability.

**Professional Experience**

**Bestlink Technologies Co., LTD** 10/2023 - 12/2023

Supervision Engineer of the Wireless Network Base Station Ningbo, China

* Supervised the installation and commissioning of wireless communication base stations.
* Monitored base station construction progress and managed project timelines, providing technical training and oversight for construction staff.
* Managed the setup, troubleshooting, and completion of indoor signal coverage systems while maintaining and updating site documentation.

**C1-515 Wireless Communication Laboratory** 09/2021 - 09/2022

Research Assistant Hangzhou, China

* Maintained and installed laboratory computers running Windows and Linux operating systems.
* Managed laboratory equipment and inventory, providing internal technical support for devices such as projectors, surveillance systems, and printers.
* Organized and planned internal cabling for the laboratory using Visio and SketchUp, including cabinet installations and securing routers and switches.

**Awards & Honors**

Undergraduate Graduate with Honours, ZUST 06/2024

First-Class Academic Excellence Award, ZUST 2022-2023

Second Prize, 9th National College Student Mobile Communication 5G Technology Competition 05/2022

Second Prize, 2021 Zhejiang Province College Student Physics Innovation Theory Competition 01/2022

Merit Student Award, ZUST 2021-2022

Second-Class Scholarship for Outstanding Students, ZUST 2021-2022

Third Prize, 14th National College Student Mathematics Competition 2021-2022

**Technical Skills**

Programming Languages: C, C++, Python, Matlab, SQL (Structured Query Language)

Operating Systems: Windows, MacOS

Research (software): Maple, Mathematics, Matlab, Mathtype, Latex(Overleaf)

Programming (software): Visual Studio, PyCharm, CLion, Colab Google

Simulation and Practical Experiment (Software and Hardware): Proteus, Diamond, Keil, 51 single-chip Microcomputer, STM32, Sketchup, Visio

Tools: Transformer, Conda, PyTorch, Jupyter Notebook