ZHANG, Hongzhen

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Education Backgrounds

Tianjin University *Master's degree in Engineering. 2017.09 – 2020.01, GPA: 85/100.*

Modules: Stochastic Process, Optimization Methods, Advanced Physics, Signal Processing, and Advanced Sensor Technology.

Xiamen University *Bachelor's degree in Engineering, Double degree in Economics. 2013.09 – 2017.06, GPA: 82/100.*

Modules: Calculus, Linear Algebra, Numerical Analysis, Analog/Digital Electronics, Engineering Optics, Signal & System.

Minor in Mathematical Statistics, modules: Mathematical Statistics, Probability, Multivariate Statistics, Bayesian Statistics.

Publications

- **Extension of Terahertz Time Domain Spectroscopy: A Micron-level Thickness Gauging Technology**
  Hongzhen Zhang, Lili Shi, Mingxia He*. *Optics Communications*, 506 (2022) 127597.
- **Terahertz Thickness Measurement Based on Stochastic Optimization Algorithm (in Chinese)**
  Hongzhen Zhang, Mingxia He*, Lili Shi, Pengfei Wang. *Spectroscopy and Spectral Analysis*, 40(2020) 3066-3070.
- **A terahertz material detection technology developed with Rouard's Method**
  with Mingxia He, Lili Shi and Pu Wang. Invention patent, Patent No. CN201910303091.9
- **A multispectral imaging device for the Meibomian glands of human eyes**
  with Yanping Chen, Tianyu Zheng and Yifan Yang. Invention patent, Patent No. CN201610250677.X

Research Experiences

Research on terahertz signal processing and spectrum analysis

Tianjin University, Funded by National Natural Science Foundation of China (NSFC) (Grant No.61675151). In order to extract information from the detected terahertz pulses which propagated through solid mediums, we constructed mathematical models in time and frequency domains by embedding desired information such as *time-of-flights* (ToFs), *phase differences*, and *complex refractive index* into model parameters. With metaheuristic optimization algorithms or the Least Angle Regression algorithm, targeted model parameters were calibrated through minimizing a residual-based loss function and the desired information could be extracted simultaneously. Our method was successfully validated in scenarios of coating layer detection and material characterization. More details: https://github.com/HongzhenGit/Information-Extraction-Methods-for-Terahertz-Spectra.

Research on a multispectral imaging device for meibomian glands of human eyes

Xiamen University, Undergraduate research project. A multiple spectral imaging device was developed to assist in the therapy process for human meibomian glands. Using our device, the region of meibomian glands could be highlighted with clear boundaries through model-based image enhancement.

Research on HAR (Heterogeneous Autoregression) models for Shanghai Composite Index

Xiamen University, Graduation thesis (Double Degree). A HAR model was constructed using 5-min high frequency data of Shanghai Composite Index, to analyze volatilities caused by traders with different expectations and risk appetites.

Working Experiences

Runyang Chemical (RYC, Shandong) *GM Secretary, 2022.08 till now*

Discover Financial Service (DFS, Shanghai COE) *Senior Analyst, 2020.03 – 2022.07*

- Project 1: Time series model for forecasting future loan application volumes, towards future workforce management.
- Project 2: NLP text analysis project for analyzing customers' feedbacks, towards risk/operation strategy improvement.
- Project 3: Data management APP development, towards third party cost tracking and reporting.

Analog Devices (ADI, Beijing Office) *Part-time Algorithm Intern, 2019.07 – 2020.01*

For reducing the circuit scale of DPD (Digital Pre-distortion) component in power amplifiers, the Least Angle Regression algorithm was leveraged to implement a sparse pre-distortion model where the number of parameters was constrained.

Awards

- Innovation Award at Discover Financial Service
- Excellence Award at Discover Financial Service
- 1st prize of China National Mathematical Modeling Competition (undergraduate group)

Programming Skills

I have solid skills in Python, MATLAB and SQL language and I am also familiar with R software. For more information about myself and my experiences/coding works, please check my personal website https://hongzhengit.github.io/.