Wang Hanqing

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EDUCATION

Saint Petersburg State University Saint Petersburg, Russia

Chebyshev laboratory 2021 - 2023
M.S. Pure Mathematics (English taught)

Relevant Courses: Homological Algebra, Theory of Harmonic Measure, Toric Varieties, Riemannian Geometry, Smooth dynamics

Peking University Beijing, China

B.S. Information and Computing Science 2012 - 2017

Relevant Courses: Mathematical Analysis, Advanced Algebra, Geometry, Probability Theory, Theory of Functions of Complex Variables, Partial Differential Equations, Differential Geometry, Combinatorics

Research

Finsler geometry Saint Petersburg, Russia

Master thesis 2022

For one paper in *PAMS* about second fundamental form of isometric embedding of 2-dimensional manifold with second-order flat Finsler metric to 3-dimensional Minkowski-Finsler space, we proved its generalization of isometric embedding of 3-dimensional Finsler manifold into 4-dimensional Minkowski-Finsler space. Under certain condition, we proved its generalization of n-dimension Finsler manifold for arbitrary n.

We proved a family of extra properties which is easy in small dimension, ex. $dim = 2$, but nontrivial in higher dimensions, like existence of canonical normal vector of all osculating Riemannian metric of tangent plane.

The proof uses techniques like osculating Riemannian metric, Cartan tensor in Finsler geometry and Blaschke-Kakutani ellipsoid characterization in convex geometry.

Supervisor: Sergey Ivanov, Professor of Saint Petersburg State University

Work Experience

Peking University Library Beijing, China

Computer Engineer 2018 - 2021

Data Processing: Used python to process book catalog data and applied statistical analysis for library use.

Website Coding: Teamwork with engineer manager Zhang Yuanjun, Renjun in Peking University to build five websites for five different departments in Peking University using CSS, Javascript and PHP Drupal framework.

Leader: Zhu Qiang, Previous Director of Peking University Library

Programs

Universal constructions in metric geometry Saint Petersburg, Russia

Minicourse Sept. 2022 - Dec. 2022

Introduction to metric geometry and Alexandrov space. Learned the notion of length space, Urysohn space, Gromov-Hausdorff metric.

Supervisor: Anton Petrunin, Professor of Pennsylvania State University

Ramanujan and Euler: Partitions, mock theta functions, and q-series Saint Petersburg, Russia

summer school July 2022

Learned the historical development of conjectures in analytic number theory and additive number theory. Took the lectures of parition of integers of combinatorics like partition identities, Partition bijections, Q-series

Supervisor: Nikolay Vavilov, Professor of Saint Petersburg State University

Neural Computing Beijing, China

Summer Program in Peking University July 2019 - Aug. 2019

Implemented the mathematical algorithm and learned biological intuition of Hodgkin-Huxley Model, Oja's Rule, Independent Components, Hopfield Net, Contrast Divergence Algorithm.

Supervisor: Tai Sing Lee, Professor of Carnegie Mellon University

Big Data Program in Traffic Beijing, China

Traffic Data Visualization Sept. 2015 - Dec. 2015

Parsed the traffic road data from "openstreetmap". Used python to do the data cleaning, to categorize different types of detailed traffic road data and visualize the Beijing traffic network. Processed the private taxi data from government for traffic flow control.

Supervisor: Li Tiejun, Professor of Peking University

Big Data Seminar Beijing, China

Stock Price Prediction March 2015 - June 2015

Collaborated with Chen Jiajie (now PhD in Caltech) to build a wavelet tight frame model to preprocess the Microsoft stock price data and applied neural network to predict the future price. The new algorithm minimized the prediction loss by 12%.

Supervisor: E Weinan, Professor of Princeton University

Big Data Program in Wind Power Generation Beijing, China

Wind Flow Prediction Feb. 2015 - July 2015

Our team used linear interpolation and fluid dynamics algorithm to optimize for future wind power prediction. We applied statistical analysis and data analysis to detect the broken wind turbines.

Supervisor: Zhang Pingwen, Wen Zaiwen, Professors of Peking University

SKILLS

English

TOEFL October 2022
Reading 27, Listening 25, Speaking 23, Writing 28 Grade: 103

GRE Dec. 2020
Verbal 152, Math 169, Writing 3.5 Grade: 321

Programming

Python, Matlab, Javascript, Drupal

Awards

Freshmen Prize (25000 RMB/4000$)