Xuechao Wang

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Research Interests: computer vision, healthcare, explainable AI, deep learning.

Education

•Ghent University *2021.09 – Present*
Ph.D. in Computer Science, Department of Mathematics: Analysis, Logic, and Discrete Mathematics Ghent, Belgium

•Beihang University (BUAA) *2018.09 – 2021.01*
M.Sc. in Applied Mathematics, School of Mathematics and Physics Beijing, China

•Shandong Normal University (SDNU) *2014.09 – 2018.09*
B.Sc. in Mathematics, School of Mathematics and Statistics Jinan, China

Publications

- **PointExplainer: Towards Transparent Parkinson's Disease Diagnosis**.
  Xuechao Wang, Sven Nõmm, Junqing Huang, Kadri Medijainen, Aaro Toomela, Michael Ruzhansky.
  Under review. Available on arXiv: 2505.03833.

- **LSTM-CNN: An Efficient Diagnostic Network for Parkinson's Disease Utilizing Dynamic Handwriting Analysis**.
  Xuechao Wang, Junqing Huang, Marianna Chatzakou, Kadri Medijainen, Aaro Toomela, Sven Nõmm, Michael Ruzhansky.
  Computer Methods and Programs in Biomedicine, 2024.
  DOI: 10.1016/j.cmpb.2024.107921. Preprint: 2311.11756.

- **Comparison of One-, Two-, and Three-Dimensional CNN Models for Drawing-Test-Based Diagnostics of Parkinson's Disease**.
  Xuechao Wang, Junqing Huang, Marianna Chatzakou, Sven Nõmm, Elli Valla, Kadri Medijainen, Pille Taba, Aaro Toomela, Michael Ruzhansky.
  Biomedical Signal Processing and Control, 2023.
  DOI: 10.1016/j.bspc.2023.105907. Preprint: 2309.14288.

- **Semi-Sparsity for Smoothing Filters**.
  Junqing Huang, Haihui Wang, **Xuechao Wang**, Michael Ruzhansky.
  IEEE Transactions on Image Processing, 2023.
  DOI: 10.1109/TIP.2023.3244325. Preprint: 2107.00627.

- **A Lightweight CNN Model for Efficient Parkinson's Disease Diagnostics**.
  Xuechao Wang, Junqing Huang, Marianna Chatzakou, Kadri Medijainen, Pille Taba, Aaro Toomela, Sven Nõmm, Michael Ruzhansky.
  36th International Symposium on Computer-Based Medical Systems (CBMS), 2023.
  DOI: 10.1109/CBMS58004.2023.10178828. Preprint: 2302.00973.

- **An Efficient Neural Network for Parkinson's Disease Using Dynamic Handwriting Analysis**.
  Xuechao Wang, Sven Nõmm, Junqing Huang, Marianna Chatzakou, Michael Ruzhansky.
  In *Extended Abstracts MWCAPDE 2023*, 2024.
  DOI: 10.1007/978-3-031-41665-1_11.

- **Text Matching as Time Series Matching**.
  Xuechao Wang.
  In *Extended Abstracts 2021/2022*, 2024.
  DOI: 10.1007/978-3-031-42539-4_32.

- **Performing Particle Image Segmentation on an Extremely Small Dataset**.
  Marianna Chatzakou, Junqing Huang, Bogdan V. Parakhonskiy, Michael Ruzhansky, Andre G. Skirtach, Junnan Song, **Xuechao Wang**.
  In *Extended Abstracts 2021/2022*, 2024.
  DOI: 10.1007/978-3-031-42539-4_33.

Talks & Presentations

•Conference Presentation, IEEE CBMS 2023, L'Aquila, Italy (TCCLS Best Student Paper Award) *2023*

Referees

•**Prof. Michael Ruzhansky,**Ghent University&Queen Mary University of London, *michael.ruzhansky@ugent.be*

•**Prof. Sven Nõmm,** Tallinn University of Technology (TalTech), *sven.nomm@taltech.ee*

Projects

•**Parkinson's Disease Diagnosis**
Deep learning analysis of dynamic handwriting signals for early PD detection and interpretability.

•**Microscopic Particle Segmentation**
SAM-based foundational models for prompt-guided segmentation of diverse microscopic particle morphologies.

•**Prognosis Prediction for Salivary Gland Cancer**
Survival modeling using clinical and follow-up data for individualized risk prediction.

•**Alloy Powder Impurity Detection**
Computer vision methods for detecting impurities in alloy powder microscopy.

•**Text Matching Model for Book Retrieval**
BM25 recall + RAM-CNN ranking for efficient large-scale book retrieval.

•**Time Series Forecasting for Prelaunch Book Sales**
Forecasting framework combining historical and seasonal patterns; deployed in industry.

Technical Skills

Software/Platforms: Python, PyQt, Linux, HPC clusters (Slurm)

Teaching Experience

•**Teaching Assistant,** Higher Mathematics in Liberal Arts, Beihang University *2020*

•**Mentor,** Undergraduate Innovation & Entrepreneurship Program, Beihang University *2020*

Awards

•**COVID-19 Extension Funding,** Ghent University *2025*

•**TCCLS Best Student Paper Award,** IEEE CBMS *2023*

•**Full PhD Scholarship,** Ghent University *2021*

•**First Class Scholarship,** Haihui Data Analysis Laboratory, Beihang University *2020*

•**Second Class Scholarship,** Beihang University *2020*

•**Second Class Scholarship,** Haihui Data Analysis Laboratory, Beihang University *2019*

•**Second Class Scholarship,** Beihang University *2019*

•**First Class Scholarship,** Shandong Normal University *2015*

Patents

- *A Machine Learning–Based Method and System for Prognostic Survival Stage Prediction.*
  Chinese Invention Patent, Publication No. **CN114496306A**, 2022.