CS PhD Seminar Series

May 6th | 14:30-15:30 | Room 217

Implementation and Evaluation of Multipath Mitigation Algorithm in GNSS PPK Using Smartphone Data in Urban Environments

Urban environments significantly affect GNSS (Global Navigation Satelite Sistem) PPK (Post-Processed Kinematic) positioning accuracy due to multipath effects. This study explores an advanced multipath mitigation technique integrated into a customized RTKLIB version, which dynamically adjusts satellite observation weights based on signal conditions. Tests using raw GNSS data from smartphones in various urban scenarios showed up to 50% error reduction compared to standard processing. The approach outperformed traditional SNR-based and statistical methods, demonstrating enhanced positioning reliability in challenging environments and highlighting the potential of advanced signal processing and sensor fusion for smartphone-based applications.



Speaker: Andrea Maffia

Andrea Maffia is a second-year PhD student in Computer Science at the University of Genoa. Currently he is working as GNSS Engineer at GTER in Genoa. His research focuses on advanced GNSS positioning algorithms and sensor fusion techniques.

Tackling Data Scarcity and Fairness in Automated X-ray Landmark Detection

Automated anatomical landmark detection in medical imaging is crucial for various clinical applications but is often hampered by the scarcity of annotated data. This presentation reviews recent advancements addressing this challenge in X-ray analysis. We explore the journey from evaluating standard transfer learning techniques to employing novel self-supervised and few-shot methods, including diffusion models and incremental learning approaches, which significantly improve performance when labeled data is minimal. Furthermore, we highlight the critical need to move beyond pure accuracy by examining algorithmic fairness, revealing that fairness issues can exist even in balanced datasets, potentially impacting specific landmarks. The presentation concludes by emphasizing the goal of developing landmark detection systems that are not only accurate and data-efficient but also robustly fair across diverse patient populations.

Speaker: Roberto Di Via

Roberto Di Via is a Ph.D. student in Computer Science working at MaLGa, University of Genoa, under the supervision of Prof. Francesca Odone and Prof. Vito Paolo Pastore. He received his B.S. degree in Computer Science at the University of Genova in 2021 and his M.S. in Data Science & Engineering at the University of Genova in 2023. His research focuses on the analysis of medical images through computer vision and machine learning approaches in data-scarce scenarios.





