

1. Record Nr.	UNINA9910874659903321
Autore	Liu Yunhao
Titolo	Location, Localization, and Localizability : Location-Awareness Technology for Wireless Networks
Pubbl/distr/stampa	Singapore : , : Springer Singapore Pte. Limited, , 2024 ©2024
ISBN	981-9731-76-3
Edizione	[2nd ed.]
Descrizione fisica	1 online resource (214 pages)
Altri autori (Persone)	YangZheng
Disciplina	006.7/6
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	<p>Intro -- Preface to the Second Edition -- Preface -- Book Organization -- Anticipated Audience -- Acknowledgments -- Contents -- About the Authors -- Chapter 1: Introduction -- 1.1 Location-Based Services -- 1.1.1 Location-Based Applications -- Motivating Example: GreenOrbs -- 1.1.2 Location-Aided Network Functions -- Routing -- 1.1.3 Topology Control -- Coverage -- Boundary Detection -- Clustering -- 1.2 Introduction to Localization -- 1.3 Book Organization -- References -- Chapter 2: Physical Measurements -- 2.1 Distance Measurements -- 2.1.1 Radio Signal Strength -- 2.1.2 Time of Arrival (ToA) -- One-Way Propagation Time Estimation -- Round-Trip Propagation Time Estimation -- Symmetric Double-Sided Two-Way Ranging (SDS-TWR) -- BeepBeep -- 2.1.3 Time Difference of Arrival (TDoA) -- 2.1.4 Channel State Information (CSI) -- Ray-Tracing Model -- Scattering Model -- 2.2 Angle Measurement -- 2.3 Area Measurement -- 2.3.1 Single Reference Area Estimation -- 2.3.2 Multi-Reference Area Estimation -- 2.4 Hop Count Measurements -- 2.5 Neighborhood Measurement -- 2.6 Summary -- References -- Chapter 3: One-Hop Location Estimation -- 3.1 Distance-Based Positioning Techniques -- 3.2 TDoA-Based Positioning Techniques -- 3.3 AoA-Based Positioning Techniques -- 3.4 RSS-Profilin-Based Positioning Techniques -- 3.4.1 Offline Profiling Scheme -- 3.4.2 Online Profiling Scheme -- References -- Chapter 4: Range-Based Network Localization -- 4.1 Computation Organization -- 4.2 Centralized Localization</p>

Approaches -- 4.2.1 Multidimensional Scaling (MDS) -- 4.2.2 Semidefinite Programming (SDP) -- 4.3 Distributed Localization Approaches -- 4.3.1 Beacon-Based Localization -- Iterative Trilateration -- Finite Localization by Bilateration -- 4.3.2 Coordinate System Stitching -- Local Map Stitching -- Component Stitching -- 4.4 Summary -- 4.4.1 Beacon Nodes.
4.4.2 Node Density -- 4.4.3 Accuracy -- 4.4.4 Cost -- References -- Chapter 5: Range-Free Network Localization -- 5.1 Basic Hop-Based Algorithms -- 5.1.1 DV-Hop -- 5.1.2 Amorphous -- 5.2 Improved Hop-Based Algorithms for Anisotropic Networks -- 5.2.1 PDM-Based Localization in Anisotropic Networks -- 5.2.2 Rendered Path in Networks with Holes -- 5.2.3 Delaunay Complex-Based Localization -- Basic Delaunay Complex-Based Algorithm -- Incremental Landmark Selection Scheme -- 5.3 Proximity-Based Algorithms -- 5.3.1 Point-in-Triangulation Test -- 5.3.2 Perpendicular Intersection -- 5.3.3 Relative Distance Estimation -- 5.4 Summary -- References -- Chapter 6: Error Control -- 6.1 Measurement Errors -- 6.1.1 Errors in Distance Measurements -- 6.1.2 Negative Impact of Noisy Ranging Results -- 6.2 Error Characteristics -- 6.2.1 What Is CRLB -- 6.2.2 CRLB for Multi-hop Localization -- 6.2.3 CRLB for One-Hop Localization -- 6.3 Localization Ambiguities -- 6.4 Location Refinement -- 6.4.1 A Framework of Location Refinement -- 6.4.2 Metrics for Location Refinement -- 6.5 Outlier-Resistant Localization -- 6.5.1 Explicitly Sifting -- 6.5.2 Implicitly De-Emphasizing -- What Is Robust Statistics? -- Robust Statistics Based Localization -- 6.6 Summary -- References -- Chapter 7: Localizability -- 7.1 Network Localizability -- 7.2 Graph Rigidity -- 7.2.1 Globally Rigid Graphs -- 7.2.2 Conditions for Network Localizability -- 7.3 Inductive Construction of Globally Rigid Graphs -- 7.3.1 Trilateration -- 7.3.2 Wheel -- 7.4 Node Localizability -- 7.5 Summary -- References -- Chapter 8: Robust Indoor Localization -- 8.1 Introduction -- 8.2 Overview -- 8.2.1 Classical Fingerprinting Framework -- 8.2.2 ViViPlus Overview -- 8.3 Spatial Awareness of RSS Fingerprints -- 8.3.1 Limitations of RSS Fingerprints -- 8.3.2 RSS Spatial Gradient -- RSG Matrix Specification.
RSG Matrix Superiority -- 8.4 ViViPlus Design -- 8.4.1 Realization of RSS Spatial Gradient -- Profiling a Reference Location -- Discretization of RSG Matrix -- Profiling a Query Fingerprint -- 8.4.2 Localization with RSG Matrices -- DANN-Based Method -- Eigenvector-Based Method -- SIFT-Like Method -- 8.5 Implementations and Evaluation -- 8.5.1 Experiment Methodology -- System Implementation and Workflow -- Experimental Scenarios and Datasets -- Comparative Methods -- Evaluation Metrics -- 8.5.2 Overall Performance -- Different Localization Methods with RSG Matrix -- Overall Performance Comparison -- Absolute vs. Discrete RSG Matrix -- Performance with Different Conditions -- Performance Comparison with Different Time Interval -- Long-Term Performance Comparison -- 8.5.3 Impact of Parameters -- Impacts of Neighbor Number -- Impacts of AP Number -- Impacts of Domain Number -- 8.5.4 ViViPlus in Mobile Tracking -- 8.6 Related Works -- 8.7 Summary -- References -- Chapter 9: Automatic Fingerprint Database Update -- 9.1 Introduction -- 9.2 System Overview -- 9.3 Adversarial Learning-Based Robust Localization -- 9.3.1 Fingerprint-Image Transformer -- 9.3.2 Feature Extractor -- 9.3.3 Location Predictor -- 9.3.4 Domain Discriminator -- 9.3.5 Spatial Constraint -- 9.3.6 Objective and Training -- 9.4 Cotraining-Based Reliable Model Update -- 9.4.1 Reliable Fingerprint Selection -- 9.4.2 Diversity Augmentation -- 9.4.3 Rationale Behind Reliable Model Update -- 9.5 Implementation and Evaluation -- 9.5.1 Experimental Methodology -- 9.5.2 Performance Evaluation -- 9.5.3 Study of Core

Components -- 9.6 Related Work -- 9.7 Summary -- References --
Chapter 10: Location Privacy -- 10.1 Introduction -- 10.2 Threats --
10.2.1 How Can the Adversary Obtain Location Information of Others?
-- 10.2.2 What Is the Negative Consequence of a Location Leak?.
10.3 Protection Strategies -- 10.3.1 Regulatory Approaches -- 10.3.2
Privacy Policies -- 10.3.3 Anonymity -- 10.3.4 Obfuscation -- 10.4
Anonymity-Based Approaches -- 10.4.1 k-Anonymity -- 10.4.2 Mix
Zone -- 10.4.3 Using Dummies -- 10.4.4 Path Confusion -- 10.4.5
Comparison -- 10.5 Summary -- References.
