HYUNSEOK (DANIEL) JANG

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Research Interests: Network Measurement, Wireless and Cellular Communication, Web

EDUCATION AND GRANTS

Tamayyuz (Excellence) Research Fellowship   *September 2023 - August 2024*
New York University Abu Dhabi

New York University Abu Dhabi   *August 2018 - May 2023*
BSc Computer Science; Applied Mathematics Minor

PREPRINTS

Roam Without a Home: Unraveling the Airalo Ecosystem [Manuscript]
- HyunSeok Daniel Jang, Matteo Varvello, Andra Lutu, Yasir Zaki
- *Under submission, ACM MobiSys '25*

Challenges and Opportunities for Global Cellular Connectivity [Manuscript]
- Viktoria Vomhof, HyunSeok Daniel Jang, Matteo Varvello, Stefan Geißler, Yasir Zaki, Tobias Hoßfeld, Andra Lutu
- *Under submission, ACM SIGCOMM Computer Communication Review '25*

A Tale of Three Location Trackers: AirTag, SmartTag, and Tile [Manuscript]
- HyunSeok Daniel Jang, Hazem Ibrahim, Rohail Asim, Matteo Varvello, Yasir Zaki
- *Under submission, IEEE Transactions on Mobile Computing*

CONFERENCE ABSTRACTS

Poster: A First Look at IPX Hub Breakout with Airalo [Extended Abstract]   *November 2024*
ACM Internet Measurement Conference 2024   *Madrid, Spain*

RESEARCH EXPERIENCE

NYUAD Communication Networks Lab   September 2023 - Present
Research Assistant   *Abu Dhabi, UAE*

Global Cellular Connectivity via Mobile Network Aggregators (MNAs)
2 papers under submission
- Analyzed Airalo's global network infrastructure, identifying unique roaming topologies and routing inefficiencies via IP-based mapping and traceroute analysis, offering key insights into IPX Hub Breakout (IHBO) implementation.
- Evaluated performance of IHBO deployment across latency, bandwidth, CDN, DNS, and video streaming metrics.
- Investigated Internet gateway deployment patterns of four MNAs, proposing location-aware allocation strategies to improve geographical granularity and performance in international roaming services.

Bluetooth Low Energy (BLE) Location-Tracking Systems
Under submission, IEEE Transactions on Mobile Computing
- Led a large-scale empirical evaluation of major BLE trackers (AirTag, SmartTag, Tile) through controlled experiments and worldwide deployments, assessing accuracy and reliability.
- Formulated statistical models of positional error reported by trackers, applying empirical findings to enhance hypothetical cross-platform location tracking.

Satellite Network for In-Flight WiFi
Paper manuscript in progress, to be submitted for publication in spring 2025
- Executing longitudinal performance measurements of in-flight WiFi solutions using GEO or MEO satellite networks.
- Constructing emulated measurements on LEO satellite networks for aviation, assessing their potential to improve inflight WiFi experience while addressing connectivity challenges such as frequent handovers.

Amigo: Mobile Network Measurement Testbed
- Scaled compatibility of an open-source network testbed, enabling automated network diagnostics via varied Android devices, network configurations, and user scenarios.

- Engineered and integrated mobile apps, browser plugins and server infrastructure to collect comparative network metrics (e.g., ping, bandwidth, CDN performance) across diverse network providers.

Dissemination of Political Content in TikTok
Data collection and analysis in progress
- Developed an automated TikTok user simulation and data collection pipeline on Android to analyze political content delivered through the platform's recommendation algorithm and assess its potential electoral implications.

RELATED PROFESSIONAL EXPERIENCE

FINAKLE June - August 2022
Backend Developer, Intern *Seoul, South Korea*
- Modernized legacy infrastructure and designed backend APIs for a FinTech platform
- *Utilized*: Python FastAPI, AWS, MariaDB

TeamSparta Inc. April - November 2021
Software Engineer, Intern *Seoul, South Korea*
- Developed web applications for a large-scale education platform, improving user engagement and system reliability
- *Utilized*: JavaScript, TypeScript, jQuery, React.js, Next.js, Python, Flask, Docker, AWS, MongoDB

PROJECTS

Renta-Cloth July 2021 - January 2022
- Built male clothing rental service as a progressive web application (PWA) by using Next.js FE and Node.js BE
- Recipient of honors and funding from Korea University Business School Startup Institute

The Gazelle September - December 2020
Deputy Web Chief
- Maintained student publication website with React.js and Node.js to provide reliable service for 1,500 readers

Print Overflow November 2019
- Built an email automation service updating students with their print history to help reduce paper waste on campus
- Received First Place Award at NYUAD Annual Hackathon 2019

CERTIFICATIONS

AWS Certified Solutions Architect - Associate July 2023
Validation Number: ZRNNKBT1X2Q4QGKL

SKILLS

Programming	C, C++, Java, JavaScript, Python, SQL, Scala
Web	HTML, CSS, jQuery, React.js, Node.js, Flask, PHP, FastAPI
Software	Docker, Hadoop, Spark