Jose Paolo Talusan

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WORK EXPERIENCE

Postdoctoral Researcher 5/2022 – Present
Institute for Software Integrated Systems, Vanderbilt University *Nashville, TN, USA*
Advisor: Dr. Abhishek Dubey abhishek.dubey@vanderbilt.edu

- Working closely with public transit agencies to develop algorithms to optimize transit workflows.
- Formulating optimization problems as Markov Decision processes and solving them using Monte Carlo Search Trees, including EV charger optimization and transit stationing and dispatch.
- Mentoring graduate students and improving current workflows by deploying them on the cloud.

Postdoctoral Researcher 9/2020 – 3/2022
Nara Institute of Science & Technology *Nara, Japan*
Advisor: Dr. Keiichi Yasumoto yasumoto@is.naist.jp

- Researching on cyber-physical systems for transportation networks, with an emphasis on the internet of things and distributed computing over edge devices
- Working in collaboration with partner institutes on implementing anomaly-based incident detection for smart transportation cyber-physical systems

R&D Engineer & Software Test Engineer 12/2015 – 9/2017
Nokia *Quezon City, Philippines*

- Maintained, developed and tested features for Nokia's base stations. Used C/C++ and Java.

Software Developer 11/2014 — 11/2015
Smart Communications *Quezon City, Philippines*

- Developed backend applications for local mobile carriers, used primarily C++ and Java.

Software Developer 06/2011 – 06/2013
Canon Information Technologies *Quezon City, Philippines*

- Developing new features and implementing bug fixes for Canon's printer systems. Work done primarily in C/C++.

VOLUNTEER EXPERIENCE

Web Chair for ICCPS (2023) 5/2023
ACM/Institute of Electrical and Electronics Engineers (IEEE) *San Antonio, USA*
- Designing and creating entire conference website.

Publicity and Ph.D forum chair for SMARTCOMP (2023) 3/2023
Institute of Electrical and Electronics Engineers (IEEE) *Nashville, USA*
- Disseminate information and host a session for PhD students.

Program Committee for IEEE ICA (2023) 12/2023
Institute of Electrical and Electronics Engineers (IEEE) *Kyoto University, Japan*

- Reviewing 3 papers from the session.

PhD Forum program committee for IEEE Percom (2023) 3/2023
Institute of Electrical and Electronics Engineers (IEEE) *Atlanta, USA*
- Reviewing 3 papers from the session.

Web Chair for IEEE PerFlow (2022) 5/2022
Institute of Electrical and Electronics Engineers (IEEE) *Pisa, Italy*
- Designing and creating entire conference website.

EDUCATION

Nara Institute of Science and Technology Nara, Japan
Ph.D. in Engineering *12/2020*
- Thesis: Design and Implementation of Decentralized Smart City Services on the Edge
- Developed a middleware framework for Internet-of-Things (IoT) for use in resource-constrained edge devices enabling services without the presence of centralized architectures.
- Worked in collaboration with other institutes from both the USA and Japan as part of the US-JAPAN Network Opportunity (JUNO-2) project.

Ateneo de Manila University Quezon City, Philippines
M.S. in Engineering *3/2015*

INTERNATIONAL CONFERENCES

Han, C., **Talusan, J. P.**, Freudberg, D., Mukhopadhyay, A., (2024). "Forecasting and Mitigating Disruptions in Public Bus Transit Services". In: *The 23rd International Conference on Autonomous Agents and Multi-Agent Systems (AAMAS)*.

Bin Zulqarnain, A., Gupta, S., **Talusan, J. P.**, Freudberg, D., (2023). "Addressing APC Data Sparsity in Predicting Occupancy and Delay of Transit Buses: A Multitask Learning Approach". In: *2023 IEEE International Conference on Smart Computing (SMARTCOMP)*, pp. 17–24. DOI: 10.1109/SMARTCOMP58114.2023.00020.

Islam, J., **Talusan, J. P.**, Bhattacharjee, S., Tiausas, F., (2022). "Anomaly based Incident Detection in Large Scale Smart Transportation Systems". In: *2022 ACM/IEEE 13th International Conference on Cyber-Physical Systems (ICCPS)*, pp. 215–224. DOI: 10.1109/ICCPS54341.2022.00026.

Talusan, J. P., Mukhopadhyay, A., Freudberg, D., Dubey, A., (2022). "On Designing Day Ahead and Same Day Ridership Level Prediction Models for City-Scale Transit Networks Using Noisy APC Data". In: *2022 IEEE International Conference on Big Data (Big Data)*, pp. 5598–5606. DOI: 10.1109/BigData55660.2022.10020390.

Tomita, S., **Talusan, J. P.**, Nakamura, Y., Suwa, H., (2022). "FedTour: Participatory Federated Learning of Tourism Object Recognition Models with Minimal Parameter Exchanges between User Devices". In: *2022 IEEE International Conference on Pervasive Computing and Communications Workshops and other Affiliated Events (PerCom Workshops)*, pp. 667–673. DOI: 10.1109/PerComWorkshops53856.2022.9767391.

Nakamura, Y., **Talusan, J. P.**, Mizumoto, T., Suwa, H., (2021). "ProceThings: Data Processing Platform with In-Situ IoT Devices for Smart Community Services". In: *Adjunct Proceedings of the 2021 International Conference on Distributed Computing and Networking*. ICDCN '21. Nara, Japan: Association for Computing Machinery, pp. 116–121. ISBN: 9781450381840. DOI: 10.1145/3427477.3429275. URL: https://doi.org/10.1145/3427477.3429275.

Tiausas, F., **Talusan, J. P.**, Ishimaki, Y., Yamana, H., (2021). "User-centric Distributed Route Planning in Smart Cities based on Multi-objective Optimization". In: *2021 IEEE International Conference on Smart Computing (SMARTCOMP)*, pp. 77–82. DOI: 10.1109/SMARTCOMP52413.2021.00031.

Talusan, J. P., Wilbur, M., Dubey, A., Yasumoto, K., (2020). "On Decentralized Route Planning Using the Road Side Units as Computing Resources". In: *2020 IEEE International Conference on Fog Computing (ICFC)*, pp. 1–8. DOI: 10.1109/ICFC49376.2020.00009.

Wilbur, M., Samal, C., **Talusan, J. P.**, Yasumoto, K., (2020). "Time-dependent Decentralized Routing using Federated Learning". In: *2020 IEEE 23rd International Symposium on Real-Time Distributed Computing (ISORC)*, pp. 56–64. DOI: 10.1109/ISORC49007.2020.00018.

Talusan, J. P. (2019). "Distributed Processing Middleware on Mesh Network for Connectivity Challenged Environments". In: *2019 IEEE International Conference on Pervasive Computing and Communications Workshops (PerCom Workshops)*, pp. 457–458. DOI: 10.1109/PERCOMW.2019.8730782.

Talusan, J. P., Tiausas, F., Stirapongsasuti, S., Nakamura, Y., (2019a). "Evaluating Performance of In-Situ Distributed Processing on IoT Devices by Developing a Workspace Context Recognition Service". In: *2019 IEEE International Conference on Pervasive Computing and Communications Workshops (PerCom Workshops)*, pp. 633–638. DOI: 10.1109/PERCOMW.2019.8730693.

Talusan, J. P., Tiausas, F., Yasumoto, K., Wilbur, M., (2019b). "Smart Transportation Delay and Resiliency Testbed Based on Information Flow of Things Middleware". In: *2019 IEEE International Conference on Smart Computing (SMARTCOMP)*, pp. 13–18. DOI: 10.1109/SMARTCOMP.2019.00022.

Guico, M. L., Abrajano, G., Domer, P. A., **Talusan, J. P.,** (2018). "Design and Development of a Novel Acoustic Rain Sensor with Automated Telemetry". In: *MATEC Web Conf.* 201, p. 03003. DOI: 10.1051/matecconf/201820103003. URL: https://doi.org/10.1051/matecconf/201820103003.

Nakamura, Y., Umetsu, Y., **Talusan, J. P.**, Yasumoto, K., (2018). "Multi-Stage Activity Inference for Locomotion and Transportation Analytics of Mobile Users". In: *Proceedings of the 2018 ACM International Joint Conference and 2018 International Symposium on Pervasive and Ubiquitous Computing and Wearable Computers.* UbiComp '18. Singapore, Singapore: Association for Computing Machinery, pp. 1579–1588. ISBN: 9781450359665. DOI: 10.1145/3267305.3267526. URL: https://doi.org/10.1145/3267305.3267526.

Talusan, J. P., Nakamura, Y., Mizumoto, T., Yasumoto, K., (2018). "Near Cloud: Low-cost Low-Power Cloud Implementation for Rural Area Connectivity and Data Processing". In: *2018 IEEE 42nd Annual Computer Software and Applications Conference (COMPSAC)*. Vol. 02, pp. 622–627. DOI: 10.1109/COMPSAC.2018.10307.

JOURNAL PUBLICATIONS

Islam, M. J., **Talusan, J. P.**, Bhattacharjee, S., Tiausas, F., (June 2023). "Scalable Pythagorean Mean Based Incident Detection in Smart Transportation Systems". In: *ACM Trans. Cyber-Phys. Syst.* Just Accepted. ISSN: 2378-962X. DOI: 10.1145/3603381. URL: https://doi.org/10.1145/3603381.

Tiausas, F., Yasumoto, K., **Talusan, J. P.**, Yamana, H., (June 2023). "HPRoP: Hierarchical Privacy-Preserving Route Planning for Smart Cities". In: *ACM Trans. Cyber-Phys. Syst.* Just Accepted. ISSN: 2378-962X.

Talusan, J. P. V., Wilbur, M., Dubey, A., Yasumoto, K., (Sept. 2020). "Route Planning Through Distributed Computing by Road Side Units". In: *IEEE Access* 8, pp. 176134–176148. DOI: 10.1109/ACCESS.2020.3026677.

ADDITIONAL INFORMATION

Best paper nominee: "Anomaly based Incident Detection in Large Scale Smart Transportation System" in the 13th ACM/IEEE International Conference on Cyber-Physical Systems (ICCPS)
Scholarship awarded: Japanese Government Scholarship (9/2017)

TECHNICAL SKILLS

Languages: Python, C/C++, Scripting, Rust
Frameworks: Flask, Dask, Spark
Developer Tools: Git, Docker, Google Cloud Platform, VS Code
Libraries: Tensorflow, Plotly, Pandas, NumPy, Matplotlib