Sannara EK

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Education

- **PhD in Computer Science** *September 2021 – November 2024*
  Thesis on Personalized Federated Learning for Pervasive Heterogeneous Environments Grenoble, France
  Supervised by Philippe Lalanda and François Portet
  Université Grenoble Alpes
- **Master in Informatics** *September 2018 – September 2020*
  Specialized in Artificial Intelligence for Graphics, Vision and Robotics Grenoble, France
  Université Grenoble Alpes - Grenoble INP
- **Bachelor in Software Engineering with Multimedia** *June 2013 – May 2017*
  Specialized in Mobile Computing and Development Phnom Penh, Cambodia
  Limkokwing University of Creative Technology

Experience

- **Research Intern** *June 2020 – November 2020*
  Laboratoire d'Informatique de Grenoble - GETALP Grenoble, France
  - Developed personalized federated learning algorithms for sensor-based human activity recognition
  - Published state-of-the-art articles in top tier conferences for pervasive computing
- **Research Intern** *June 2019 – September 2019*
  Laboratoire d'Informatique de Grenoble - GETALP Grenoble, France
  - Research and development on cognitive measurement methods using eye-tracking devices for understanding human-computer interaction
- **Software Engineer** *August 2017 – September 2018*
  Udaya Technology Co., Ltd Phnom Penh, Cambodia
  - Developed mobile applications using Java and Swift for Android and iOS platforms
  - Collaborated with cross-functional teams to deliver software solutions in healthcare and education sectors

Honors and Awards

- **IEEE PerCom Travel Grant** *March 2023*
  IEEE Computer Society
  - Chosen to receive student travel grant to attend the 21st International Conference on Pervasive Computing and Communications
- **Tan Sri Datos Sri Paduka Limkokwing Award for Creativity and Innovation** *May 2017*
  Limkokwing University of Creative Technology - Cambodia
  - Awarded for outstanding achievements in creativity and innovation during undergraduate studies
- **Valedictorian of the years 2015-2017** *May 2017*
  Limkokwing University of Creative Technology - Cambodia
  - Selected as the Valedictorian for the graduation ceremony, representing the 2015-2017 cohort

Skills

- **Expertise Domain:** Machine Learning, Mobile and Pervasive Computing, Federated Learning, Wearable Human Activity Recognition, Computer Vision
- **Programming Languages:** Python [Tensorflow, Pytorch], Java, Swift, SQL
- **Languages:** Khmer [Native], English [IELT 8.0], Japanese [B1], French [B1]

Exchanges

- **Visiting Research Assistant** *August 2024 - September 2024*
  The Hong Kong Polytechnic University - IMCL Lab Hong Kong, China
  ◦ Participated in a research exchange to extend federated learning findings into the vision domain

- **Visiting Student Researcher** *October 2022 - November 2022*
  University of Milan - EveryWare Lab Milan, Italy
  ◦ Engaged in research on pre-trained and self-supervised learning models for human activity recognition

- **Visiting Student Researcher** *November 2021*
  Université de Lorraine - Institut Jean Lamour Nancy, France
  ◦ Investigated deep learning solutions for arc fault detection

References

- **Prof. Philippe Lalanda** *philippe.lalanda@univ-grenoble-alpes.fr*
  PhD Supervisor Université Grenoble Alpes

- **Prof. Claudio Bettini** *claudio.bettini@unimi.it*
  Research Exchange Host University of Milan

- **Prof. Jiannong Cao** *jiannong.cao@polyu.edu.hk*
  Research Exchange Host The Hong Kong Polytechnic University

Publications

Ek, Sannara, Kaile Wang, François Portet, Philippe Lalanda, and Jiannong Cao (2025). "FedAli: Personalized Federated Learning with Aligned Prototypes through Optimal Transport". In: *(Under revision)*.

Ek, Sannara, Riccardo Presotto, Gabriele Civitarese, François Portet, Philippe Lalanda, and Claudio Bettini (2024). "Comparing Self-Supervised Learning Techniques for Wearable Human Activity Recognition". In: *arXiv preprint (Under revision)*.

Ek, Sannara, François Portet, and Philippe Lalanda (2023). "Transformer-based models to deal with heterogeneous environments in Human Activity Recognition". In: *Personal and Ubiquitous Computing*, pp. 1–14.

Presotto, Riccardo, **Sannara, Ek**, Gabriele Civitarese, François Portet, Philippe Lalanda, and Claudio Bettini (2023). "Combining Public Human Activity Recognition Datasets to Mitigate Labeled Data Scarcity". In: *2023 IEEE International Conference on Smart Computing (SMARTCOMP)*, pp. 33–40.

Ek, Sannara, Philippe Lalanda, and François Portet (2022). "Federated Learning Within Pervasive Heterogeneous Environments". In: *2022 IEEE International Conference on Pervasive Computing and Communications Workshops and other Affiliated Events (PerCom Workshops)*. IEEE, pp. 134–135.

Ek, Sannara, François Portet, Philippe Lalanda, and German Vega (2022). "Evaluation and comparison of federated learning algorithms for Human Activity Recognition on smartphones". In: *Pervasive and Mobile Computing* 87.

Ek, Sannara, Romain Rombourg, François Portet, and Philippe Lalanda (2022). "Federated Self-Supervised Learning in Heterogeneous Settings: Limits of a Baseline Approach on HAR". In: *2022 IEEE International Conference on Pervasive Computing and Communications Workshops and other Affiliated Events (PerCom Workshops)*. IEEE, pp. 557–562.

Ek, Sannara, François Portet, Philippe Lalanda, and German Eduardo Vega Baez (2021). "Evaluating Federated Learning for human activity recognition". In: *Workshop AI for Internet of Things, in conjunction with IJCAI-PRICAI 2020*.

Ek, Sannara, François Portet, Philippe Lalanda, and German Vega (2021). "A federated learning aggregation algorithm for pervasive computing: Evaluation and comparison". In: *2021 IEEE International Conference on Pervasive Computing and Communications (PerCom)*. IEEE, pp. 1–10.

Ek, **Sannara**, François Portet, Philippe Lalanda, and German Vega (2020). "Evaluation of federated learning aggregation algorithms: application to human activity recognition". In: *Adjunct Proceedings of the 2020 ACM International Joint Conference on Pervasive and Ubiquitous Computing and Proceedings of the 2020 ACM International Symposium on Wearable Computers*, pp. 638–643.