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Summary

Ph.D. in Computer Science Engineering with expertise in multimodal learning (audio, video), generative models, and privacy-preserving ML. Experienced in deploying ML systems in unconstrained real-world environments, with a focus on domain adaptation, privacy constraints, and multimodal representation learning. Proven track record of resolving domain shift and data scarcity challenges through unsupervised techniques across both vision and acoustic sensing systems. Motivated to apply this expertise to research at the intersection of multimodal AI and societal impact, where data integrity, privacy, and trustworthiness are critical.

Education

Ph.D.	<i>Ghent University, Belgium</i>
· <i>Computer Science Engineering</i>	2019-2025
Master of Science	<i>National Cheng Kung University (NCKU), Taiwan</i>
· <i>Computer and Communication Engineering.</i>	2014-2016
Bachelor of Science	<i>National Cheng Kung University (NCKU), Taiwan</i>
· <i>Electrical Engineering.</i>	2010-2014

Experience

Doctoral Researcher (*Ghent University, 2019-2025*)

- Conducted research on multimodal (audio-visual) surveillance with real-world data, developing generative-based and privacy-preserving ML methods to tackle domain shift, data scarcity, and unauthorized information leakage in real-world environments. Resulted in 4 peer-reviewed journal publications.
- Collaborated with industry partner Asasense to analyze state-of-the-art models behave on 5000+ hours of real-world audio, informing robustness requirements for deployment.
- Provided technical mentorship for a master's thesis on visual anonymization for traffic surveillance, guiding research directions, SOTA model evaluation, and structured case study analysis.

Teaching Assistant (*Ghent University, 2021-2023*)

- Mentored non-technical graduate students through end-to-end ML lifecycles, translating complex concepts into actionable frameworks and guiding teams to formulate business-driven solutions (e.g., fraud-risk detection, commercial market analysis).
- Facilitated an official technical collaboration with Sony Depthsensing Solutions by digesting their proprietary scripts and devices into structured project scopes, guiding student teams through full ML pipelines from data collection to functional gesture recognition prototypes.

Co-President & Editor (*UGent TSA & Taiwan Science and Technology Division, 2020-2022*)

- Co-President (TSA): Served as the primary liaison between the expatriate community and government during the pandemic. Coordinated cross-org resources during the pandemic, strengthening cross-cultural communication, incident-response coordination, and prioritization under uncertainty.
- Contributing Editor (Global Research Network Linkage Program): Analyzed key technology and policy developments within the European Union, translating complex technical frameworks into concise strategic briefing reports for government and enterprise stakeholders.

Graduate Research Assistant (*pre-PhD, 2015-2016*)

- Led a student-only team to engineer and pitch AI surveillance prototypes at international entrepreneurial competitions (APICTA, InnoServe), outperforming corporate counterparts and achieving tech transfer.
- Co-developed a multimodal driver monitoring system with national-level partner ARTC, managing the end-to-end pipeline from physical sensor deployment and raw data acquisition to final prototype analysis.

Projects

Applied AI Systems: Job-Hunter Multi-Agent Co-pilot (*Self-initiated, 2025-present*)

- Engineered a cost-aware Mixture-of-Advisors system integrating a hybrid routing gateway (Gemma/Gemini) and ChromaDB-backed RAG to automate semantic data triage. This orchestrated pipeline drastically compressed processing time and optimized API quota, establishing the architectural foundation for ongoing research in LoRA-augmented vision models for synthetic data generation.

Multi-modal Surveillance: From Lab to Street (*Ph.D. Research, 2021-2025*)

- Addressed the fundamental challenges of transitioning AI from academic benchmarks to real-world deployment with data-centric mechanisms and system-level architectures. Formulated model-agnostic solutions to tackle extreme **data scarcity**, environmental **domain shifts**, and strict **privacy** constraints, ensuring long-term system robustness alongside rapidly evolving SOTA models.
- **Representation Learning**: Developed a **multimodal** pair-generation mechanism to tackle false negatives and the information bottleneck in **contrastive learning**. Reframing temporally misaligned signals as semantic anchors yielded task-agnostic representations outperforming SOTA by ~10%, enabling a single encoder to power multiple downstream tasks without retraining (Published in *Frontiers in Robotics and AI*).
- **Privacy-Preserving AI**: Architected a plug-in, "opt-in" privacy framework leveraging **adversarial learning** and **generative-based models** (CycleGAN) to actively suppress sensitive attributes at the signal level for audio or visual data. Reduced unauthorized attribute extraction to near-random chance while maintaining <6% utility degradation on target tasks, enabling secure operational deployment without requiring backend model retraining. (Published in *IEEE Pervasive Computing and Applied Intelligence*)
- **Model Assessment In-the-Wild**: Devised a task-agnostic assessment utilizing Randomly Initialized Neural Networks and **embedding similarity metrics** to evaluate models across unknown downstream tasks. Eliminated dependency on source data and target labels while predicting real-world performance on par with fully supervised baselines, enabling data-sovereign model selection prior to **unsupervised domain adaptation** (Published in *Sensors*).

SenseCity: Real-World Acoustic Surveillance (*Ph.D. Research, 2019-2021*)

- Evaluated the real-world viability of SOTA sound tagging models and WaveNet-based **generative architectures** on **unconstrained city-scale audio data**, exposing catastrophic domain shifts. Formulated a context-specific edge pipeline that successfully filtered ~90% of normal events, providing empirical guidelines for robust operational deployments.

Early Applied Computer Vision Research (*Pre-PhD, 2014-2018*)

- **Driver Monitoring**: Addressed limitations of traditional driver monitoring systems by developing a hierarchical model with online sparse representation and temporal face descriptors, reducing computational overhead and improving detection accuracy by up to 15% (Published in *IEEE TITS*).
- **Smart Surveillance**: Optimized visual readability for surveillance results via MRF-based energy minimization, reducing both annotation occlusion and visual tracking distance by more than 80%, while effectively minimizing visual jittering and label intersections (Published in *IEEE TCSVT*).

Publications

Authored 12 publications (7 journals, 140+ citations) including works in IEEE venues (*TIP, TITS, TCSVT*), alongside leading applied AI Q2 journals (*Sensors, Applied Intelligence, Frontiers in Robotics and AI*).

For a complete list of publications, see: [Google Scholar](#)

Skills

Python, PyTorch, TensorFlow, Weights & Biases, TensorBoard, C++, OpenCV, Docker, Git, Linux