

# Thomas Napier

PhD Candidate | IT Educator | Machine Learning and Ecoacoustics Researcher  
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## SUMMARY

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I am a final-year PhD Candidate and IT educator in the College of Science and Engineering at James Cook University. My research focuses on machine learning for ecoacoustic and bioacoustic data analysis, with particular emphasis on scalable soundscape segmentation, unsupervised clustering, adaptive sound event detection, and human-in-the-loop annotation for biodiversity monitoring.

Alongside my research, I have taught across a range of information technology subjects, including programming, data mining, cloud computing, cybersecurity, and network security. I received the University Medal from James Cook University in 2021 and have been recognised through several competitive research grants, teaching awards, travel awards, and international doctoral consortium opportunities.

## SKILLS

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**Programming Languages:** Python, Bash, SQL/PostgreSQL, Java, C#, Javascript, Dart, HTML5, CSS3, PHP

**ML/DL Libraries:** TensorFlow, PyTorch, Scikit-learn, Timm, XGBoost, HDBSCAN, UMAP-learn, OpenCV

**Audio & Signal Processing:** Librosa, SoundFile, SciPy Signal, PyDub, Raven Pro, Audacity, BirdNET, MFCCs, mel spectrograms, acoustic indices

**Data Science & Analysis:** Pandas, NumPy, SciPy, Statsmodels, WEKA, Jupyter, Matplotlib, Seaborn, Plotly, Dash, Dash Bootstrap Components

**Development & Deployment:** Git, GitHub, RESTful APIs, Docker, AWS, Conda, pip, PyInstaller, Linux/Unix command line

**AR & Interactive Systems:** Unity 3D, Google ARCore, AR Foundation, Vuforia

## EXPERIENCE

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### Research Assistant, James Cook University (2021 - 2025)

Significantly contributed, as a chief investigator, to four 1-year multidisciplinary research and commercialisation projects in collaboration with industry partners like the Australian Abalone Growers Association, HelloClaims and ResPax across technical areas including mobile app development, augmented reality, database management and optimisation, deep learning and data mining.

- Designed, developed and deployed production-ready deep learning models (image classification, instance segmentation, object detection) to automate vehicle panel damage assessments for the insurance industry.
- Developed a PostgreSQL database and RESTful API to enable secure data management and advanced data mining for a mobile tourism data collection tool.

- Created "CodeCraft," a mobile-based AR and ML educational tool to modernize and teach complex database concepts, which received over 80% "excellent" usefulness ratings in user testing.
- Conducted literature reviews, user testing, and qualitative evaluations; synthesised findings into actionable insights and future research directions.
- Engaged in regular agile meetings with stakeholders to align technical development with evolving project goals.

### **Sessional Lecturer & Tutor, James Cook University (February 2019 – Present)**

Taught and supported information technology students at James Cook University since 2019. My teaching work includes subject coordination, lecturing, practical delivery, assessment design, marking, moderation, curriculum development, and student support.

- Coordinated and lectured in core subjects including Programming, Network Security, Internet Fundamentals, Cloud Computing, Database Modelling, and e-Strategic Management.
- Delivered practical sessions and marking for subjects including Programming I & II, Web Design and Development, Data Mining, Content Management Systems, Python for Data Analytics, Information Processing and Visualisation, Database Systems, Design Thinking, and Internet Fundamentals.
- Led the end-to-end development of teaching materials for two new Master of IT (Cybersecurity) subjects, CP5411 Malware Analysis and CP5408 Cyber Security Strategy, Governance and Risk Management
- Authored and revised assessment instruments, including the redevelopment of Cloud Computing exams to ensure alignment with academic integrity standards.
- Overhauled the practical curriculum for CP3403 Data Mining subject, replacing WEKA-based workflows with a Python-based pipeline to improve industry relevance and student outcomes.
- Identified and addressed conceptual gaps during tutorials, enhancing student understanding through adaptive explanations and applied examples.

### **IS&T Service Desk Analyst, Glencore Australia (February 2018 – August 2021)**

Industry experience working in an enterprise IT service delivery role. Work included regular stakeholder communication, systems administration, and incident-management experience.

- Provided first-line technical support for more than 13,000 users across Glencore Copper and Zinc Operations in Queensland in a high-volume enterprise service environment.
- Delivered more than 3,500 direct support calls using System Centre Service Manager, applying incident management, escalation, documentation, and service-resolution practices.
- Administered and supported enterprise systems including Active Directory, Microsoft Exchange, RSA/VPN, VMware Horizon, FortiClient, PhenixID, Windows, Microsoft Office, SharePoint, PowerShell, Cisco tools, and remote/mobile support platforms

## EDUCATION

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### **James Cook University, Townsville, Australia (February 2022 – August 2026)**

Doctor of Philosophy (Information Technology). Species Classification using Machine Learning-based Signal Processing Techniques in Natural Soundscapes

### **James Cook University, Townsville, Australia (February 2017 – December 2021)**

Bachelor of Information Technology (Honours), First Class (1A), 7.00/7.00 GPA.

## PUBLICATIONS

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I have produced 8 publications comprising of 6 peer-reviewed journal articles and 3 conference papers. I am the first author on 8 publications, and my work has been cited 90 times (Google Scholar) with a h-index of 4.

### **Journal Articles**

**Napier, T.**, Ahn, E., Allen-Ankins, S., Schwarzkopf, L., & Lee, I. (Manuscript under review). An Efficient Pipeline for the Unsupervised Segmentation of Heterogeneous Natural Soundscapes. *Ecological Informatics* (**Impact Factor: 7.3**).

**Napier, T.**, Ahn, E., Allen-Ankins, S., Schwarzkopf, L., & Lee, I. (2025). LEAVES: An open-source web-based tool for the scalable annotation and visualisation of large-scale ecoacoustic datasets using cluster analysis. *Ecological Informatics* (**Impact Factor: 7.3**).

**Napier, T.**, Ahn, E., Allen-Ankins, S., Schwarzkopf, L., & Lee, I. (2024). Advancements in preprocessing, detection and classification techniques for ecoacoustic data: A comprehensive review for large-scale Passive Acoustic Monitoring. *Expert Systems with Applications*, 252, 124220 (**Impact Factor: 8.5**).

**Napier, T.**, & Lee, I. (2023). Using mobile-based augmented reality and object detection for real-time Abalone growth monitoring. *Computers and Electronics in Agriculture*, 207, 107744 (**Impact Factor: 8.9**).

Munksgaard, N. C., Lee, I., **Napier, T.**, Zwart, C., Cernusak, L. A., & Bird, M. I. (2023). One year of spectroscopic high-frequency measurements of atmospheric CO<sub>2</sub>, CH<sub>4</sub>, H<sub>2</sub>O and δ<sup>13</sup>C-CO<sub>2</sub> at an Australian Savanna site. *Geoscience Data Journal*, 10(4), 461-470 (**Impact Factor: 3.3**).

### **Conference Papers**

**Napier, T.**, Ahn, E., Allen-Ankins, S., & Lee, I. (Accepted). A data-driven approach for discovering pure clusters in complex multi-source terrestrial soundscapes. *Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD)*.

**Napier, T.** (2026). Creating Generalizable Data-Driven Approaches for Biodiversity Monitoring via Acoustics. *Proceedings of the AAAI Conference on Artificial Intelligence*, 40(48), 41070–41071.

**Napier, T.**, Ahn, E., Allen-Ankins, S., & Lee, I. (2023). An Optimised Grid Search Based Framework for Robust Large-Scale Natural Soundscape Classification. In *Proceedings of the 36th Australasian Joint Conference on Artificial Intelligence* (pp. 468-479).

## AWARDS, GRANTS and RECOGNITION

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- Feb 2026**      **CSE HDR Competitive Grant Round 2 2025 (\$3,000), James Cook University.** Highly competitive internal research training grant awarded to support HDR research activities and professional development.
- Dec 2025**      **Best Oral Presentation (\$500), Annual Engineering, IT, and Physical Sciences HDR Conference, James Cook University.**
- Nov 2025**      **AAAI-26 Doctoral Consortium Travel Award, Singapore (\$3,375), AAAI.** Competitive travel grant supporting participation in the AAAI-26 Doctoral Consortium, including flights and accommodation.
- Sept 2025**      **Sessional Teaching Award for Outstanding Contributions to Student Learning (\$500), James Cook University.** Recognition for outstanding sessional teaching, including innovation, leadership, and sustained impact on student learning and the overall student experience.
- Oct 2024**      **HDR CSE Incentive Award (\$500), James Cook University.** Awarded to higher degree by research candidates in the College of Science and Engineering for strong research performance, including accepted publications and external grant success supporting timely completion.
- Apr 2023**      **CSE Competitive Research Training Grant 2023 (\$2,000), James Cook University.** Highly competitive internal research training grant awarded from a pool of 70 applications to support HDR research activities and development.
- Mar 2023**      **Bev Frangos Graduate Instructor Prize (\$500), James Cook University.** Prize awarded to a Masters or PhD student in Electrical and Electronic Engineering, Electronic Systems and Internet of Things Engineering, or Information Technology for outstanding contribution to teaching.
- Nov 2022**      **AJCAI 2022 Doctoral Consortium Travel Grant, Perth, Western Australia (\$900).**
- Jan 2022**      **Research Training Program Scholarship (\$254,802), James Cook University.** Highly competitive postgraduate scholarship funded under the Australian Government Research Training Program and awarded on the basis of academic merit and research potential.
- Sept 2021**      **University Medal, James Cook University.** Awarded for outstanding undergraduate academic achievement, including a GPA above 6.50, First Class Honours Level A, completion of an Honours research component, and endorsement by the College Dean as a meritorious recipient.
- May 2018**      **Letter of Commendation, James Cook University.** Recognition for achieving a GPA of 6.00 or higher across first-year Information Technology subjects.

## PRESENTATIONS

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- 6<sup>th</sup> World Ecoacoustic Congress 2026, Cairns, Australia
- Pacific Asia Conference on Knowledge Discovery and Data Mining (PAKDD) 2026 Doctoral Consortium, Hong Kong, China

- Association for the Advancement of Artificial Intelligence (AAAI) 2026 Doctoral Consortium, Singapore
- Cornell University, K. Lisa Yang Center for Conservation Bioacoustics – BioacousTalks Spring 2025 program
- Australasian Joint Conference on Artificial Intelligence (AJCAI) 2022 Doctoral Consortium, Perth, Western Australia
- Queensland University of Technology Ecoacoustics Symposium 2022, Brisbane, Australia

**REFEREES [available on request]**

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