University of Stuttgart
Institute of Entrepreneurship and Innovation Science (ENI)

Call for:
M A S T E R T H E S I S

Advancing Capabilities in Technology Scouting and Weak Signal Detection

Topic Description:
Leading organizations must simultaneously address present challenges while anticipating future technological developments. A key strategic priority for innovation-driven firms is to systematically explore emerging technologies and trends to identify opportunities and challenges that may shape their future. This Master's thesis project offers the opportunity to analyze and contribute to technology scouting practices, with a specific focus on detecting weak signals—early indicators of technological change that may have significant business implications.
Building on existing research, including the work of Shankar, Bettmann, and Giones (2022) in the California Management Review, this project will examine how organizations identify and evaluate signals of emerging technological developments, particularly in information technologies and artificial intelligence (AI), that could be integrated into future products and services.

This project will be co-sponsored and co-supervised by an external company. You may be eligible for financial compensation while working on this project.

Goals & Expected Contributions:
1. **Mapping Critical Technology Areas** – Identifying core technology domains relevant to the organization and analyzing their interdependencies and evolution over time.
2. **Assessing Technology Scouting Capabilities** – Investigating how organizations detect and monitor emerging trends and technological advancements.
3. **Modeling the Existing Scanning System** – Developing a structured representation of current tools and processes for technology scouting and weak signal detection.
4. **Proposing an Enhanced Scanning Model** – Designing alternative approaches that incorporate **technology families and functional perspectives** to improve and refine technology scouting capabilities.

Initial Readings:

- Shankar, R. K., Bettenmann, D., & Giones, F. (2023). Building Hyper-Awareness: How to Amplify Weak External Signals for Improved Strategic Agility. *California Management Review*, *65*(4). https://doi.org/10.1177/00081256231184912
- van Veen, B., & Ortt, R. (2021). Unifying weak signals definitions to improve construct understanding. *Futures, 134*. https://doi.org/10.1016/j.futures.2021.102837
- Holopainen, M., & Toivonen, M. (2012). Weak signals: Ansoff today. *Futures, 44*(3). https://doi.org/10.1016/j.futures.2011.10.002
- Ebadi, A., Auger, A., & Gauthier, Y. (2022). Detecting emerging technologies and their evolution using deep learning and weak signal analysis. *Journal of Informetrics, 16*(4). https://doi.org/10.1016/j.joi.2022.101344

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Your Profile:
This project is particularly suited for students with a background in both business and technology (e.g., Business Administration with a focus on Technology, Business Informatics, or related fields). However, applications from candidates with relevant expertise in technology foresight, strategic management, or innovation studies are also encouraged.

You can apply for this thesis call if you (are)…

- highly motivated to work in a structured way and in collaboration with industry partners.
- interested in the topic.
- creative and interested in learning new things, topics, and methods.
- have previously completed at least one course offered at ENI (or plan to do so during your thesis semester).

How to Apply:
Application deadline: 30.04.2025.
To apply, please prepare a max. 2-page exposé summarizing your proposed approach to the topic and a proposed preliminary overview of contents. Please also indicate if you have already completed a course at ENI and don't forget to add your contact details. You may submit your exposé via our website: https://www.eni.uni-stuttgart.de/en/teaching/Courses/Bachelor-and-Masterthesis/

If you have questions about this call, please reach out to ferran.giones@eni.uni-stuttgart.de

We are looking forward to working with you!