Internship / Master Thesis Topics 18/05/2026

About DTSC

DT Services and Consulting (DTSC) is a strategic partner helping companies and organizations add value through training and conferences, project management, continuous improvement, and Scrum & Agile services. We combine proven methodologies with a strong network of experts to deliver practical solutions tailored to client needs.

About BRAIN

BRAIN (the Belgian Research lab for AI in Industry) is an applied research initiative led by DT Services and Consulting. We rethink artificial intelligence through tailor-made solutions powered by real-world data, driven by research, and shaped by collaboration. As a Research-as-a-Service lab, BRAIN brings together students, researchers, companies, universities, and public institutions to transform ideas into practical, responsible, and scalable AI solutions. Our work focuses on creating intelligent systems that are fair, smart, human-centered, and designed to deliver real impact in industry.

Are you a student in engineering, computer science, data science, applied mathematics, statistics, or physics looking to work on advanced AI topics?

We are looking for AI, Data, and Software interns to join the BRAIN Lab at DTSC.

Research Areas

- Causal AI & graphs for complex systems
- Reinforcement Learning for decision-making and resilience
- LLMs & document automation
- Edge AI & frugal models
- Explainable AI
- Forecasting models

Profile

We are looking for students in engineering, computer science, applied mathematics, statistics, physics, or data science with:

- Strong Python skills
- Solid foundations in machine learning and/or deep learning
- Interest in graphs, reinforcement learning, LLMs, or time series
- Curiosity, rigor, and autonomy
- Good command of English

Tech Stack

Python, PyTorch, Graph ML, Reinforcement Learning, LLMs using Hugging Face / LangChain, and MLOps tools such as MLflow and Docker.

List of Topics

- D18052026-1: Development of a Data-Driven Solar Forecasting Model for Belgium
- D18052026-2: Anomaly Detection in Residential Energy Consumption Data
- D18052026-3: Developing Agentic AI Systems for Intelligent Business Process Automation
- D18052026-4: Causal Analysis for Industrial Systems: From Data to Actionable Insights
- D18052026-5: Scenario Generation for Industrial Systems: Simulation, Optimization and Decision Support

Why join us?

At DTSC and BRAIN, you will work in a research-driven environment focused on useful, pragmatic, and responsible AI. You will contribute to applied AI projects with real industrial impact, combining the spirit of a research lab with the agility of a deeptech startup.

Practical Information

Location: Belgium — Brussels, Antwerp, or Wallonia
Duration: 3 to 6 months
Opportunities: Master thesis with the possibility to continue toward a PhD

Application

Send your CV and a few lines about your interests.: https://brain.dtsc.be/join-us/

D18052026-1: Development of a Data-Driven Solar Forecasting Model for Belgium

We are seeking a motivated Master's student intern to contribute to an applied research project focused on improving solar energy forecasting in Belgium. The objective of this project is to develop a robust and data-driven approach for predicting solar power availability using meteorological data. Accurate forecasting is increasingly critical for optimizing renewable energy integration, grid stability, and energy market operations, particularly as Belgium continues to expand its solar capacity.

The intern will work with diverse datasets, including weather observations and forecasts (e.g., solar irradiance, cloud cover, temperature), as well as historical solar production data where available. The project will involve data preprocessing, exploratory analysis, and the development of predictive models using statistical and/or machine learning techniques. The student will also evaluate model performance and compare different approaches to identify the most reliable forecasting methods under Belgian climatic conditions.

This internship offers an opportunity to gain hands-on experience in energy analytics, time series modeling, and renewable energy systems. The candidate will collaborate closely with a multidisciplinary team and contribute to a solution with real-world impact on sustainable energy management. Ideal candidates have a background in engineering, data science, physics, or a related field, along with experience in programming (e.g., Python) and an interest in renewable energy.

D18052026-2: Anomaly Detection in Residential Energy Consumption Data

We are seeking a motivated Master's student intern to work on an applied research project focused on detecting anomalies in residential energy consumption data. The goal of this project is to develop intelligent methods for identifying unusual patterns in household energy usage, which may indicate inefficiencies, faulty appliances, or unexpected behavioral changes. Such insights can support more efficient energy use, cost savings for consumers, and improved demand-side management.

The intern will work with time-series data collected from smart meters and home energy monitoring systems. The project will involve data cleaning, feature engineering, and exploratory analysis to understand normal consumption patterns across different households and time periods. The student will then design and implement anomaly detection techniques, which may include statistical methods, machine learning models, or deep learning approaches tailored to time-series data.

A key part of the project will be evaluating the effectiveness of different approaches in detecting meaningful anomalies while minimizing false positives. The intern will also explore how contextual information, such as weather or occupancy patterns, can improve detection accuracy. This internship provides hands-on experience in data science, time-series analysis, and energy systems, while contributing to practical solutions for smarter energy management. Ideal candidates have a background in data science, engineering, or a related field, with programming experience (e.g., Python) and an interest in analytics and sustainability.

D18052026-3: Developing Agentic AI Systems for Intelligent Business Process Automation

We are seeking a motivated Master's student intern to work on an advanced project focused on the design and implementation of agentic AI systems within a corporate environment. The objective of this project is to explore how autonomous, goal-driven AI agents—powered by Large Language Models (LLMs)—can plan, reason, and execute multi-step tasks to support and automate complex business processes.

The intern will contribute to building AI agents capable of interacting with various enterprise tools and data sources, such as internal databases, APIs, and document repositories. The project will involve designing agent workflows, integrating tool-use capabilities, and implementing reasoning strategies (e.g., planning, memory, and reflection) to enable agents to perform tasks such as report generation, data analysis, and operational decision support. Emphasis will be placed on creating reliable and controllable systems that can operate effectively in dynamic business environments.

A key aspect of the project will be evaluating agent performance, robustness, and safety, particularly in terms of accuracy, consistency, and adherence to organizational constraints. The intern will also explore orchestration frameworks and best practices for deploying agentic AI solutions at scale. This internship offers hands-on experience at the forefront of AI innovation, combining LLMs, automation, and software integration. Ideal candidates have a background in artificial intelligence, computer science, or engineering, with strong programming skills (e.g., Python) and an interest in building next-generation intelligent systems for enterprise applications.

D18052026-4: Causal Analysis for Industrial Systems: From Data to Actionable Insights

Industrial systems such as railway networks, energy infrastructures, and IoT-enabled environments generate large volumes of heterogeneous data (sensor data, logs, events, operational constraints). While traditional analytics and machine learning approaches enable prediction and anomaly detection, they often fail to explain why certain events occur. This lack of causal understanding limits decision-making, especially in critical domains where identifying root causes is essential for optimization, resilience, and safety. The project is part of a broader data platform initiative (CORTEX) aiming to structure and exploit industrial data using advanced analytics techniques, including causal inference.

The objective of this internship is to design and implement a causal analysis framework capable of identifying cause-effect relationships within complex industrial systems. The student will explore and apply causal inference techniques (e.g., causal graphs, structural causal models, counterfactual analysis) to real-world datasets, with the goal of moving from correlation-based insights to actionable, decision-oriented knowledge. Expected outcomes include a prototype pipeline for causal discovery and inference, validated use cases (e.g., incident root cause analysis, performance optimization), and measurable business value in terms of improved diagnostics and decision support.

The work will start with data exploration and understanding of the industrial context, followed by the construction of a structured dataset leveraging an existing lakehouse architecture (Bronze/Silver/Gold layers). The student will then model causal relationships using domain knowledge and data-driven approaches (e.g., Bayesian networks, DAGs, constraint-based or score-based methods). Different causal inference techniques will be evaluated, including interventions and counterfactual reasoning. The methodology will include iterative validation with domain experts to ensure relevance and robustness. Finally, the student will develop a prototype (Python-based) integrating causal analysis into the existing data pipeline, along with visualization tools to communicate insights effectively.

D18052026-5: Scenario Generation for Industrial Systems: Simulation, Optimization and Decision Support

Industrial environments such as railway systems, supply chains, and IoT infrastructures operate under uncertainty (delays, failures, demand variability, external disruptions). Decision-makers need to anticipate multiple possible futures rather than rely on a single predicted outcome. Scenario generation is a key enabler for simulation, stress testing, and optimization of such systems. This project focuses on leveraging data and models to generate realistic and diverse operational scenarios. These scenarios can then be used to improve planning, risk management, and system resilience, particularly in critical infrastructures where robustness is essential.

The objective of this internship is to design and implement a scenario generation framework capable of producing realistic, diverse, and actionable scenarios for industrial systems. The student will develop methods to generate scenarios based on historical data, probabilistic models, and constraints, with applications such as:

- stress testing systems under extreme conditions
- evaluating optimization strategies (e.g., routing, scheduling)
- supporting decision-making through simulation

Expected outcomes include a prototype scenario generator, integration with existing optimization or simulation tools with calibration, and demonstrated business value (e.g., improved robustness, better planning decisions).

The work will begin with data analysis to understand system behavior and variability (events, delays, anomalies). The student will then design scenario generation approaches, which may include:

- probabilistic modeling (Monte Carlo simulation, distributions)
- generative models (e.g., time series generation, synthetic data)
- rule-based and constraint-based scenario construction
- integration with optimization models (e.g., VRP, scheduling)

The generated scenarios will be evaluated based on realism, diversity, and usefulness for decision-making. Iterations will be performed with domain experts to refine the approach. A Python-based prototype will be developed, potentially integrated into the existing data platform, with visualization tools to explore and compare scenarios.