

Research Fellow/Engineer (Machine Learning and NDT in  
Construction) - NTQ2  
Singapore Institute of Technology

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Posted Oct. 7, 2024, set to expire Jul. 5, 2025

**Job Title** Research Fellow/Engineer (Machine Learning and NDT in  
Construction) - NTQ2

**Department** Engineering

**Institution** Singapore Institute of Technology  
Singapore, , Singapore

**Date Posted** Oct. 7, 2024

**Application Deadline** Open until filled

**Position Start Date** Available immediately

**Job Categories** Research Scientist/Associate

**Academic Field(s)** Mechanical Engineering

**Job Website** <https://careers.singaporetech.edu.sg/cw/en/job/498708/research-fellowengineer-machine-learning-and-ndt-in-construction-ntq2>

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**Job Description**

## Research Fellow/Engineer (Machine Learning and NDT in Construction) - NTQ2

**Job no:** 498708

**Department:** Engineering

**Contract type:** Contract

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As a University of Applied Learning, SIT works closely with industry in our research pursuits. Our research staff will have the opportunity to be equipped with applied research skill sets that are relevant to industry demands while working on research projects in SIT.

The primary responsibility of this role is to deliver on an industry innovation research project where you will be part of the research team to develop a first-of-its kind AI-assisted integrated NDT verification system for reusability of structural steel with accuracy of  $\pm 10\%$  at confidence level of 95%. The key innovation is to use AI to analyse a bigger data set and build a multi-parameter machine learning (ML) model that integrate the complex mechanical properties obtained from DT and the electric/magnetic permeability data obtained from NDT to predict the critical material characteristics of reusable steels.

### Key Responsibilities

- Participate in and manage the research project with Principal Investigator (PI), Co-PI and the research team members to ensure all project deliverables are met.
- Undertake these responsibilities in the project:
  - i. **Establishing test result database:** Conducting both DTs and NDTs on the same samples to create a comprehensive dataset for AI model development, managing data collection processes on-site at the collaborator's factory, and ensuring the accuracy and integrity of the collected data.
  - ii. **Developing statistical model:** Utilizing DT results to develop statistical models for estimating mechanical characteristics based on normal distribution and analyzing statistical data to support model development.
  - iii. **Developing and verifying the AI model:** Developing various regression models and evaluate their feasibility and suitability, conducting model fitting and verification phases using training and test datasets and ensuring the selected model meets the accuracy criteria ( $\pm 10\%$  at 95% confidence) for individual mechanical characteristics and overall classification results (grade determination).
  - iv. Validation of the method: Implementing the proposed method and AI model in test bedding cases, measuring the impact of the method in terms of time and cost savings and developing implementation guidelines based on validation results.
- Carry out Risk Assessment, and ensure compliance with Work, Safety and Health Regulations.
- Coordinate procurement and liaison with vendors/suppliers.
- Work independently, as well as within a team, to ensure proper operation and maintenance of equipment.
- Publish research findings in peer-reviewed journals and present at conferences.

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- Assist in the preparation of project reports, proposals, and documentation.

### Requirements

- Have relevant competence in the areas of structural engineering, material science, statistics and programming basics.
- Have a degree in Civil Engineering, Mechanical Engineering or Material Science. Possessing a Master's or PhD degree will be advantageous.
- Knowledge of AI / ML and common ML programming languages will be advantageous.

### Key Competencies

- Able to build and maintain strong working relationships with people within and external to the university.
- Self-directed learner who believes in continuous learning and development
- Proficient in technical writing and presentation
- Possess strong analytical and critical thinking skills
- Show strong initiative and take ownership of work
- Able to carry out data preprocessing, develop statistical and regression models.
- Possess knowledge of the mechanical properties of structural steel and factors affecting its performance
- Able to prioritize tasks, meet deadlines, and manage multiple responsibilities.

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**Advertised:** 25 Sep 2024 Singapore Standard Time

**Applications close:** 31 Dec 2024 Singapore Standard Time

### Contact Information

Please reference Academickeys in your cover letter when applying for or inquiring about this job announcement.

### Contact



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