# Opening of a PhD thesis on Automating CAD Drawing Generation Using AI and 3D Geometric Learning

@Minitrucks Robotics &Imagine Team of LIRIS lab, Ecole Centrale de Lyon

**Advisors:** Liming Chen (Professor, LIRIS CNRS UMR 5205, ECL)

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## Context

Minitrucks Robotics (MTR) is an innovative company designing and assembling compact construction machines capable of operating in highly constrained environments. A critical step in the design workflow is the creation of **2D manufacturing drawings** from **3D CAD models** (SolidWorks). This process is time-consuming, repetitive, and requires high expertise, while remaining prone to human error.

Current automatic drawing-generation tools are insufficient for MTR's requirements. This PhD project aims to develop a **hybrid AI-based solution** capable of automating major parts of the drawing creation process.

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## PhD Objective

The goal is to design an intelligent system that automatically generates high-quality 2D manufacturing drawings from 3D CAD models. The research will focus on:

- **Automatic selection of relevant views** (front, top, sections…)
- **Automatic generation and placement of dimensions and annotations**
- **Automatic filling of the title block**

The project combines **geometric deep learning**, **representation learning**, and **CAD rule integration**.

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## Candidate Profile

**Required background:**

- Master's degree or engineering diploma in **Computer Science**, **AI**, **Machine Learning**, **Robotics**, **Computer Vision**, or **Mechanical Engineering** with strong algorithmic skills.

**Technical skills:**

- Strong programming skills in **Python**; C++ experience is a plus
- Experience with **deep learning frameworks** (PyTorch / TensorFlow)
- Knowledge of **3D geometry**, meshes, point clouds, or GNNs is highly valued
- Familiarity with CAD tools (SolidWorks, CATIA, Fusion360) is appreciated

**Personal skills:**

- Scientific curiosity and willingness to explore complex interdisciplinary topics
- Autonomy, rigor, and good communication skills
- Ability to collaborate with both engineers and researchers
- Good command of technical English

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## Supervision & Environment

- **Industrial partner:** MTR (mechanical design office)
- **Academic host:** LIRIS Laboratory – École Centrale de Lyon (IMAGINE research group)
- **Scientific supervision:** Prof. Liming Chen

The PhD is funded through an ANRT **CIFRE industrial doctoral contract** (36 months).

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## Location & Starting Date

- **Location:** Lyon area (shared time between MTR and École Centrale de Lyon)

- **Start date:** 2026

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## Application

Please send the following documents:

- CV
- Motivation letter
- Academic transcripts
- Any relevant project, internship, or publication
- 2 reference letters

to:liming.chen@ec-lyon.fr

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## Why Apply?

- Work on a **real-world industrial problem** with immediate impact
- Join an internationally recognized research team in **3D vision and AI**
- Develop expertise at the intersection of **AI, CAD, and geometric modeling**
- Excellent career prospects in industrial R&D, CAD intelligence, or applied AI