Laboratory for Product Development and Lightweight Design
TUM School of Engineering and Design
Technical University of Munich

AI-Driven Optimization of Component Placement on Electronic Circuit Boards

Semester- / Masterthesis or Forschungspraxis

Robot Systems Group
Laboratory for Product Development and Lightweight Design

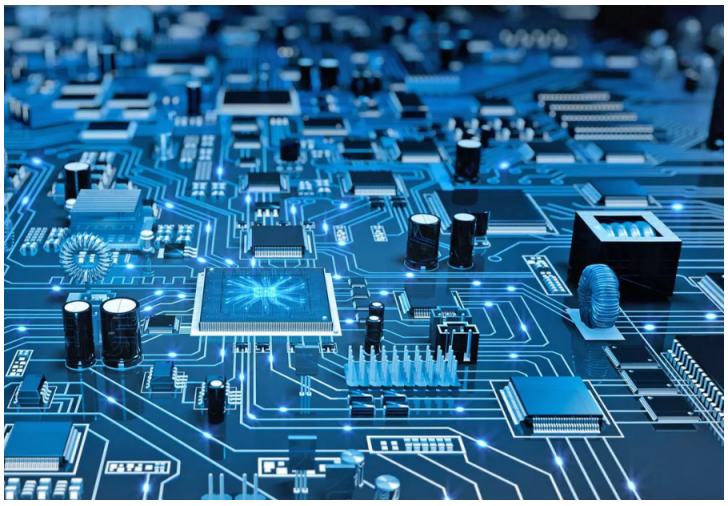

Figure 1 Placed Components on a printed circuit board (PCB) (Source: `https://cionews.co.in/`)

Project Description: We invite applications for a Master's thesis project focused on advancing the field of electronic circuit board design through the integration of artificial intelligence (AI). The objective of this project is to develop a sophisticated AI-based methodology and software that can optimize the placement of components on circuit boards, enhancing both efficiency and performance.
The project will involve the application of machine learning algorithms to predict optimal component placements based on a variety of factors, including electrical characteristics, thermal management, and physical constraints of the board. The goal is to automate the decision-making process in electronic design, reducing manual input and improving the accuracy of component placements.
This project will require the candidate to design and train AI models, possibly incorporating techniques such as reinforcement learning, neural networks, or other advanced AI methodologies. The resulting Python-based software will be integrated into existing electronic design automation tools to assess its effectiveness and efficiency in real-world scenarios.

Desired Skills: Ideal candidates will possess a strong foundation in Python programming and a keen interest in software development methodologies. Prior knowledge or experience in electronics, particularly in designing or building circuit boards, will be highly advantageous. This background will provide a valuable context for the optimization tasks and the understanding of practical constraints involved in electronic design.
Applicants are expected to demonstrate problem-solving skills, the ability to work independently, and a passion for advancing technological solutions in electronics manufacturing.

Application Process: Interested candidates should submit their application via email, including a detailed CV and a current transcript of records. Please send your applications to the Email mentioned below.
We look forward to reviewing your background and discussing how you can contribute to this innovative project.

LPL

Datum: 13.05.2024

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