**MSc Thesis Project**

Software development for automated characterization of color centers in diamond

Color centers in diamond, including the Nitrogen-Vacancy (NV) and Tin Vacancy (SnV) centers, arise from atomic defects and exhibit distinctive optical and quantum characteristics. These defects play a pivotal role in various applications, such as quantum information processing, sensing, and biotechnology, serving as a vital intersection between quantum physics and materials science to address contemporary technological challenges.
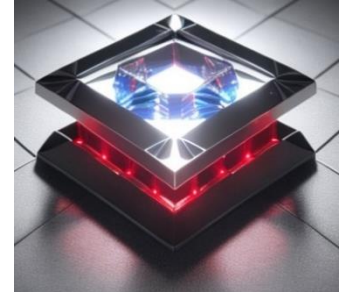

Project goals:

- Work with **Python** (mainly) to develop **software** for different drivers of our electronics, that **interfaces** with various electronic and optical components.
- **Implement** control algorithms and data acquisition routines and **collaborate** with partners from TNO to develop an automated characterization setup.

Outcome:

The successful completion of this project will provide a valuable tool for researchers working on NV and SnV centers in diamond, enabling them to conduct characterization experiments with higher precision and efficiency.

By the end of this MSc thesis project, we anticipate achieving the following outcomes:

- ✓ A fully **automated characterization setup** specifically designed for NV and SnV centers in diamond
- ✓ Reliable and efficient **software** for controlling and acquiring data from electronic and optical components
- ✓ Improved accuracy and reproducibility in the **measurement** of key parameters (T1, T2, g2)
- ✓ Strengthened **collaboration** with TNO and a deeper understanding of automated characterization techniques
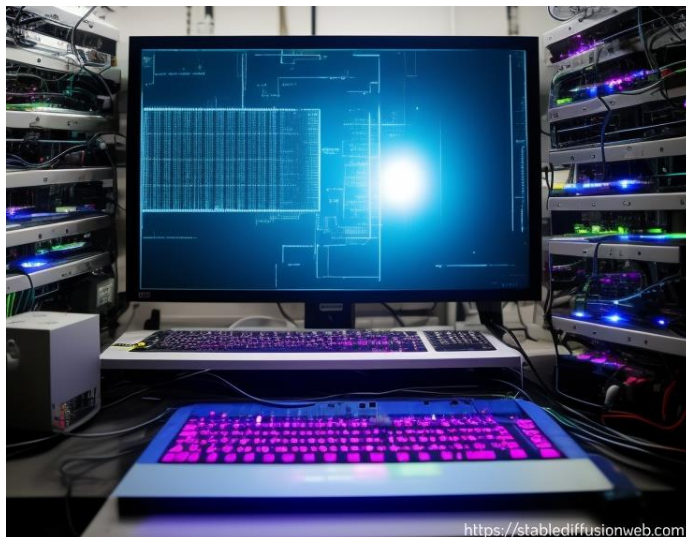
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