



Industrial Postgraduate Programme (IPP) PhD Thesis - Design of Advance Machine Learning and Deep Learning Algorithm for Pattern Recognition

Job description

Industrial Postgraduate Programme (IPP) PhD Thesis

Infineon is offering a PhD thesis topic on "Design of Advance Machine Learning and Deep Learning Algorithm for Pattern Recognition" under the Industrial Postgraduate Programme (IPP) from the Economic Development Board (EDB).

Background/ Objective:

Advance automated visual inspection tools are extensively used in the semiconductor manufacturing process as a quality screen. At the backend packaging process, sub-millimeter defects are being detected using conventional rule-based algorithms. Such rule-based algorithms are rigid and in the process of defect classification, they typically have a high occurrence of false positives and false negatives. This translates to yield loss, productivity loss, and potentially quality lapses. Using machine learning, anomaly detection and classification models have demonstrated higher accuracy. Such models are also able to recognize complex patterns and make accurate decisions.

Scope of Work:

Students will develop advanced machine learning algorithms, which are capable of accurately classifying images while minimizing the required labeled data set.

Visual inspection (Automatic defect classification):

- Outcomes: locates and classifies defects in chips.
- Benefits: reduce yield loss and man-hour for manual inspection.
- Challenges: to recognize new defects with minimal/no labeled data

Predictive maintenance (Anomaly detection)

- Outcomes: to pre-emptively detect the signs and symptom of machine failure
- Benefits: reduce excessive machine downtime, maintenance cost
- Challenges: to handle insufficient label data and domain knowledge

Production optimization (Optimization)

- Outcomes: predict final product quality/yield

At a glance

Location: **Singapore**

Job ID: **50712**

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- Benefits: Discover the key parameters/tool combination/dispatch that could affect the quality and efficiency of the production.
- Challenges: To handle unstructured data source

The candidate will receive:

- A monthly stipend of S\$4,000
- Full sponsorship of school fees

Profile

To be eligible for the IPP Scholarship, candidates must:

- Be a Singaporean Citizen or Permanent Resident at the time of application
- Be eligible for full-time PhD studies
- Have an interest in semiconductor manufacturing and machine learning/deep learning
- Knowledge in programming in Python, Java, R or MATLAB

