

Theme: Machine Intelligence

- Sub theme: Bayesian Optimization via Generative Model

As the semiconductor process continues to shrink, process optimization becomes increasingly challenging. Because the manufacturing process is highly complex, the search space for the recipe optimization is large. Also, it has to be carefully evaluated with regard to the trade-off between exploration and exploitation. We would like to approach this problem by using generative models, as opposed to the widely used Bayesian Optimization (BO) via surrogate models. This approach is known to be better at dealing with offline optimization and is easier to model high-dimensional data. BONET (Krishnamoorthy et. al., 2023) and DDOM (Krishnamoorthy et. al., 2023) are examples of such research.

Moreover, the generated recipes should follow certain constraints stated by domain experts to ensure that the candidates are valid recipes. There also exist problems with noisy input and label data. Concept drift as recipes change should also be addressed.

In this regard, we are highly interested in (but not limited to) the following list of topics:

- Generative Modeling for BO
- Uncertainty Modeling
- Constrained Optimization given a constraint by Domain Experts.
- Concept Drift
- Noisy Input/Label Treatment

※ The participants are also encouraged to propose new ideas outside the topics listed above.

※ Funding: Up to USD 150,000 per year