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Materials Robotics: A new research style for materials science

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Summary :

The integration of artificial intelligence (AI) and robotics is expected to prompt great progress in materials research. Strategies combining high-throughput synthesis with machine learning have already been producing new small organo- and bio-molecular compounds at ever faster rates.

In this study, we introduce a system utilizing Bayesian optimization to expand the search space for solid-state compounds (materials robotics). This system fully automates sample transfer, thin film deposition, evaluation, and growth condition optimization—addressing an automatic PDCA cycle.

Through the automated thin-film synthesis and optimization, we aim to establish new materials research style to drastically accelerate solid-state materials research. The approach should be expanded to other fields of research; the system can be regarded as an artificial scientist.

<http://www.apc.titech.ac.jp/~thitosugi/>

Artificial scientist

