Deep Learning for Batteries

2021-04-28

A Unique Research Institute in Deep Learning

Mission: To be a global pole for scientific advances that inspires innovation and the development of AI for the benefit of all

Founded in 1993 by Turing Award Laureate, Prof. Yoshua Bengio

In 2019, Mila moved to its unique location in O Mile-Ex creating a **distinctive AI ecosystem**, in which **AI researchers from academia and companies (large, medium and small) collaborate**

Mila's four **strategic pillars** reflect how it delivers its mission

AI Talent | **Advanced Research** | **Collaboration Projects** | **Social Influence**

Mila's Applied Research Team **collaborates with companies on their machine learning projects**
Deep-dive into this topic in the next pages

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Applied Research Projects

Distinctive Features of our Applied AI Team

Privileged **access to Mila's** 500+ faculty and student researchers

Collaborative approach to transfer knowledge to industry researchers

Significant part of the applied research team's **costs covered by Mila funding**

Mutually beneficial agreements regarding **intellectual property**

Meet some of our Experts

Scientific Direction

Joumana Ghosn

- 20+ years in ML/DL
- PhD in ML under the supervision of Y. Bengio

Project Management

Jean-Philippe Nantel

- 10+ years of data science project management
- Eng. and M.Sc. in Applied Math. & Computer Science

Project Lead

Gaétan Marceau Caron

- 9+ years in computer science and ML/DL
- Postdoc in ML

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Polymer Properties Prediction

Searching in large parameter space

LambdaZero: ongoing project for targeted drug discovery

Surrogate Models of varying complexity for properties estimation

Combining Bayesian Deep Learning and Reinforcement Learning to search for drug candidates

Could be used for lithium-conducting polymers

Need data

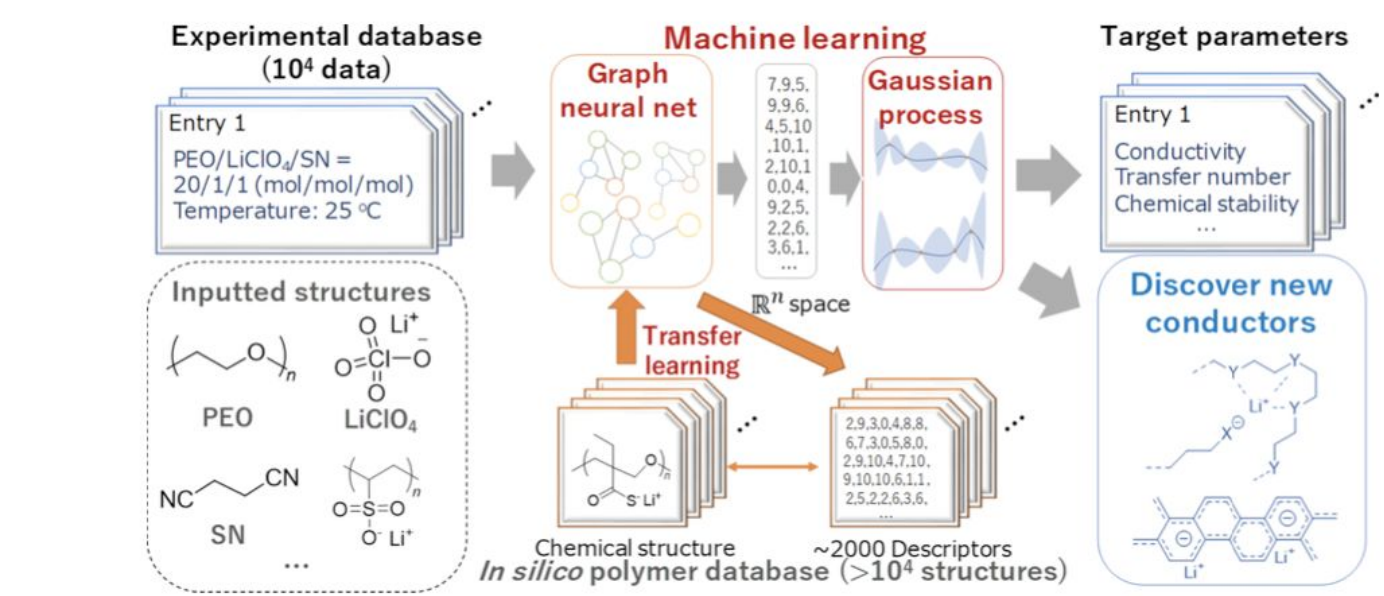

Figure 1. Scheme for predicting properties of the solid polymer electrolytes by AI. Conductivity was predicted in this study.

From; *AI-Assisted Exploration of Superionic Glass-Type Li+ Conductors with Aromatic Structures.* K. Hatakeyama-Sato, T. Tezuka, M. Umeki, K. Oyaizu. JACS **142**, 3301-3305 (2020)

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