Healthcare applications

Synthetic training data generation for medical image segmentation (Nature Communications' 25)
(**Nature Communications Editors' Highlights** - "the 50 best papers recently published")

Foundation model for medical image segmentation (ICML'24b)

Foundation model on 1.3 million medical images (NeurIPS'23a)

Pneumonia detection from CT scans (Scientific Reports'23a, Nature Portfolio)

Pneumonia detection from chest X-rays (Scientific Reports'22a, Nature Portfolio)

Brain tumor detection from MRIs (Scientific Reports'22b, Nature Portfolio)

Skin lesion detection from dermoscopy images (ICML'23b)

Pathology visual question answering (ACL'21a)

Gastrointestinal disease detection from endoscopy images (Scientific Reports'24b, Nature Portfolio)

3D medical imaging segmentation (AAAI'23)

Glaucoma progression assessment from OCTA images (British Journal of Ophthalmology'24)

Long-COVID information extraction (Scientific Reports'24a, Nature Portfolio)

Medical dialog generation (EMNLP'20, ACL'21b)

Automated medical coding (IJCAI'21)

Prediction of motor dysfunction (Tomography'21)

Pancreas solid lesion detection from endoscopic ultrasonographic images and electronic health records (JAMA Network Open'24)

Tacrolimus dosing in kidney transplant (JMIR AI'25)

ML models & methods

Large language models and foundation models

LLM reasoning
- DreamPRM-1.5 (achieving **first place on the MMMU leaderboard**, surpassing GPT-5 and Gemini 2.5 Pro)
- DreamPRM-1.0 (achieving **first place on the MathVista leaderboard**)

Pretraining (TMLR'25a, TMLR'25b)

Finetuning (ICML'24a, NAACL'24a, NAACL'24b, TMLR'25c)

Security (ICML'24b, NAACL'25)

Other (EMNLP'25a, EMNLP'25b)

Self-supervised learning (TACL'22b, TACL'21a, TACL'21b, AAAI'21a, TMM'21)

Neural architecture search (ICML'22, CVPR'21, TMLR'24)

Data generation and reweighting (ICML24'c, ACL'22)

Vision Transformer (ICLR'22, NeurIPS'24)

Graph neural networks (ICML'23c, TWEB'23)

Interpretable learning (AAAI'21b)

ML training strategies

Learning by self-explanation (NeurIPS'22)

Learning by grouping (ICML'23b)

Learning by teaching (ICLR'23b)

Small-group learning (CVPR'22)

Learning from mistakes (AAAI'22, IEEE TAI'25)

Learning by ignoring (ACL'21a)

Reading by summarizing (TACL'22a)

Others (TACL'24, ACM MM'22)

Skillearn framework

Skillearn: ML Training Strategies Inspired by Humans' Learning Skills (ICML'23a)

System

Betty: A Programming Framework for Multi-level Optimization (ICLR'23a, **Notable-Top-5% paper**) → Distributed Betty (NeurIPS'23b)