Top 5 conferences

1. The International Conference on Machine Learning (ICML)
2. Conference on Neural Information Processing Systems
3. International Joint Conference on Artificial Intelligence(IJCAI)
4. GOTO conference
5. Minds mastering machines(m3)

The International Conference on Machine Learning (ICML)

1)Do RNN and LSTM have Long Memory?

 Abstract:

The LSTM network was proposed to overcome the difficulty in learning long-term dependence, and has made significant advancements in applications. With its success and drawbacks in mind, this paper raises the question - do RNN and LSTM have long memory? We answer it partially by proving that RNN and LSTM do not have long memory from a statistical perspective. A new definition for long memory networks is further introduced, and it requires the model weights to decay at a polynomial rate. To verify our theory, we convert RNN and LSTM into long memory networks by making a minimal modification, and their superiority is illustrated in modeling longterm dependence of various datasets.

### 2) Generative Pretraining from Pixels

Abstract:

Inspired by progress in unsupervised representation learning for natural language, we examine whether similar models can learn useful representations for images. We train a sequence Transformer to auto-regressively predict pixels, without incorporating knowledge of the 2D input structure. Despite training on low-resolution ImageNet without labels, we find that a GPT-2 scale model learns strong image representations as measured by linear probing, fine-tuning, and low-data classification. On CIFAR-10, we achieve 96.3% accuracy with a linear probe, outperforming a supervised Wide ResNet, and 99.0% accuracy with full finetuning, matching the top supervised pre-trained models. An even larger model trained on a mixture of ImageNet and web images is competitive with self-supervised benchmarks on ImageNet, achieving 72.0% top-1 accuracy on a linear probe of our features.

Conference on Neural Information Processing Systems

1) Multimodal Model-Agnostic Meta-Learning via Task-Aware Modulation

Abstract:

Model-agnostic meta-learners aim to acquire meta-learned parameters from similar tasks to adapt to novel tasks from the same distribution with few gradient updates. With the flexibility in the choice of models, those frameworks demonstrate appealing performance on a variety of domains such as few-shot image classification and reinforcement learning. However, one important limitation of such frameworks is that they seek a common initialization shared across the entire task distribution, substantially limiting the diversity of the task distributions that they are able to learn from. In this paper, we augment MAML with the capability to identify the mode of tasks sampled from a multimodal task distribution and adapt quickly through gradient updates. Specifically, we propose a multimodal MAML (MMAML) framework, which is able to modulate its meta-learned prior parameters according to the identified mode, allowing more efficient fast adaptation. We evaluate the proposed model on a diverse set of few-shot learning tasks, including regression, image classification, and reinforcement learning. The results not only demonstrate the effectiveness of our model in modulating the meta-learned prior in response to the characteristics of tasks but also show that training on a multimodal distribution can produce an improvement over unimodal training.

## 2) Multi-Resolution Weak Supervision for Sequential Data

Abstract:

Since manually labeling training data is slow and expensive, recent industrial and scientific research efforts have turned to weaker or noisier forms of supervision sources. However, existing weak supervision approaches fail to model multi-resolution sources for sequential data, like video, that can assign labels to individual elements or collections of elements in a sequence. A key challenge in weak supervision is estimating the unknown accuracies and correlations of these sources without using labeled data. Multi-resolution sources exacerbate this challenge due to complex correlations and sample complexity that scales in the length of the sequence. We propose Dugong, the first framework to model multi-resolution weak supervision sources with complex correlations to assign probabilistic labels to training data. Theoretically, we prove that Dugong, under mild conditions, can uniquely recover the unobserved accuracy and correlation parameters and use parameter sharing to improve sample complexity. Our method assigns clinician-validated labels to population-scale biomedical video repositories, helping outperform traditional supervision by 36.8 F1 points and addressing a key use case where machine learning has been severely limited by the lack of expert labeled data. On average, Dugong improves over traditional supervision by 16.0 F1 points and existing weak supervision approaches by 24.2 F1 points across several video and sensor classification tasks.

International Joint Conference on Artificial Intelligence(IJCAI)

# An Algorithm for Multi-Attribute Diverse Matching

Abstract:

Bipartite b-matching, where agents on one side of a market are matched to one or more agents or items on the other, is a classical model that is used in myriad application areas such as healthcare, advertising, education, and general resource allocation. Traditionally, the primary goal of such models is to maximize a linear function of the constituent matches (e.g., linear social welfare maximization) subject to some constraints. Recent work has studied a new goal of balancing whole-match diversity and economic efficiency, where the objective is instead a monotone submodular function over the matching. Basic versions of this problem are solvable in polynomial time. In this work, we prove that the problem of simultaneously maximizing diversity along several features (e.g., country of citizenship, gender, skills) is NP-hard. To address this problem, we develop the first combinatorial algorithm that constructs provably-optimal diverse b-matchings in pseudo-polynomial time. We also provide a Mixed-Integer Quadratic formulation for the same problem and show that our method guarantees optimal solutions and takes less computation time for a reviewer assignment application.

GOTO conference

Low-temperature and low-cost excimer laser doping for poly-Si thin-film transistor fabrication

Abstarct:

The electrical properties of poly-Si thin films doped using KrF excimer laser irradiation with a phosphoric-acid coating were investigated. After laser doping, the mobility, carrier concentration, activation ratio, and contact resistivity of the poly-Si were found to be 61 cm2 /Vs, 1.5×1018 cm-3 , 18.1 %, and 8.5 × 10−5 Ω⋅cm2 , respectively. Additionally, the operation of a bottom gate transistor fabricated using laser doping was realized and is described herein.

Minds Mastering machines(m3)

# 1)A Roadmap Towards Machine Intelligence

Abstarct:

The development of intelligent machines is one of the biggest unsolved challenges in computer science. In this paper, we propose some fundamental properties these machines should have, focusing in particular on communication and learning. We discuss a simple environment that could be used to incrementally teach a machine the basics of natural-language-based communication, as a prerequisite to more complex interaction with human users. We also present some conjectures on the sort of algorithms the machine should support in order to profitably learn from the environment.

2)Deep-Learned Artificial Intelligence for Semantic Communication and Data Co-processing

Abstarct:

Trans-disciplinary activity in system-informational culture (SIC) caused great knowledge sophistication and necessity for any person to have synthesis of true scientific presentations. Complication of informational flows satiated with scientific meanings needs their co-processing with the help of deep-learned artificial intelligence (DL IA). Artificial intelligence (IA) will assist man to identify universalities for third world understanding. Otherwise, it will be impossible to live comfortably in computer instrumental systems and its applications. Arising intellectual difficulties will alter significantly SIC subject armed with DL IA − powerful means of learning, cognition, and world study. Trained rational consciousness allows achieving semantic level of communication in SIC. In its work, DL IA leans on system axiomatic method and personal cogno-ontological knowledge base descript in language of categories. Examples explain contributed technology.