Decentralized Machine Learning on the Edge

Preface

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Many of today's parallel machine learning algorithms were developed for tightly coupled systems like computing clusters or clouds. However, the volumes of data generated from machine-to-machine interaction, by mobile phones or autonomous vehicles, surpass the amount of data that can be realistically centralized. Thus, traditional cloud computing approaches are rendered infeasible.

To scale parallel machine learning to such volumes of data, computation needs to be pushed towards the edge, that is, towards the data generating devices. By learning models directly on the data sources - which often have computational power of their own, for example, mobile phones, smart sensors, and tablets - network communication can be reduced by orders of magnitude. Moreover, it enables training a central model without centralizing privacy-sensitive data. The Decentralized Machine Learning at the Edge (DMLE'18) workshop aimed to foster discussion, discovery, and dissemination of novel ideas and approaches for decentralized machine learning.

The first international DMLE'18 workshop was held in Dublin, Ireland in conjunction with ECMLPKDD. The workshop included a keynote by Dr. Michael May (Siemens AG) followed by technical presentations and a poster session. The workshop was attended by around 30 people.

The accepted papers presented interesting novel aspects of decentralized machine learning, especially in the context of edge computing. We want to thank the authors for their valuable contributions, great presentations, and lively and fruitful discussions.

We would also like to thank the DMLE'18 program committee, whose members made the workshop possible with their rigorous and timely review process. Finally, we would like to thank ECMLKPDD for hosting the workshop and the workshop chairs, Anna Monreale and Carlos Alzate for their valuable support.

Organization

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Program Committee

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