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Research Topic

Machine Learning

Research Problem

How can we rethink Machine Learning in order to improve our ability to model?

Problem Statement

Given that Machine Learning currently works by deriving general models of datasets, construct a new method for annotating and summarizing datasets such that simplified, specific models for specific queries can easily be applied to them.

Operational Definitions

Model: A formal abstraction of anything that uses mathematical and logical terminology to provide a definition.

Querying a model: Testing the output of a specific model given a set of logical or mathematical constraints (themselves approximations of a real-world situation).

Problem Description

Machine Learning attempts to solve inference problems and general queries for large datasets. The general methodology for doing so that is currently practiced is to first develop a flexible, permanent model from a dataset, and then to answer queries by applying different analytic methods to the model. Unfortunately, all of these methods rely on approximation – on trying to simplify a complex model.

To improve this method, it is necessary to conceive of a new style of machine learning where specific summarized versions of the data set are used to generate different models to answer every query. Such graphs can be combined for more complex queries, and will allow for precise inference – answering complex queries by combining simple models. How can this reconceptualization be practically achieved?

Computer Science Perspective

Machine Learning is a very current field in computer science, and one with immense potential. This research seeks to completely reinvent it.

Disciplines Actively Involved

Computer Science

Operational Definition

Actively Involved Disciplines: A Discipline from which a member would be acknowledged in the research paper or any discipline involved for which there is a professional association that fosters more knowledge of it through the scientific method.

Description of Disciplines Involved

Computer Science: This research seeks to redefine Machine Learning, a subcategory of Computer Science; thus, we can say that the field is actively involved.

References

Presenter web page:

<http://www.cs.cmu.edu/~gustrin/>

By plandweh

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