Technical University of Denmark

Popular science summary of the PhD thesis

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Title of the PhD thesis	When Your News and Labels are Unreliable
PhD school/Department	DTU Compute

Science summary

* Please give a short popular summary in Danish or English (approximately half a page) suited for the publication of the title, main content, results and innovations of the PhD thesis also including prospective utilizations hereof. The summary should be written for the general public interested in science and technology:

This thesis is composed by two parts.

The first part works on methodologies for detecting reliability and bias in American news articles, popularized as fake news detection.
The field is very challenging and requires advanced methodologies on many different types of data. We focus on news articles and in one paper we analyze copying patterns which reveal communities of news outlets. These outlets produce similar or identical content within communities, while having competing narratives between communities. We also analyze how well reliability and bias detection systems work in challenging situation such as doing long-term prediction, encountering unseen sources, and being under dedicated “fake news attacks”.
We also briefly discuss the usefulness and challenges of using such a system in practice and make all our data available for other studies.

When using machine learning we will usually use large datasets, where experts have annotated some concept which we want a machine to learn. For example journalists can find articles that are particularly biased/unbiased or reliable/unreliable, and we can show those articles to machine learning systems to see if they can learn to find such articles themselves. The labeling of news articles proved to be a difficult task due to the massive quantities of news data being published every day, limited expert resources, disagreement of how biased/unbiased or reliable/unreliable each article is etc. Here we call these problems non-standard classification, and they motivate the second part of the thesis.

In the second part we propose a principled, probabilistic, unified approach to non-standard classification tasks, such as semi-supervised, positive-unlabelled, multi-positive-unlabelled and noisy-label learning. The system used some fairly advanced techniques from machine learning and we show initial results that the method is capable of tackling a lot of these problems.

Please email the summary to the PhD secretary at the department