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## **Master Thesis: Using Information Channels to Detect and Predict “Hypes”**

In today's society, people can use diverse channels to obtain, gather and exchange information in various forms and across the entire globe. Although these information channels provide a large variety of different topics and serve all kind of different interests, every now and then topics emerge (“hypes”), which reveal structural breaks in the form of exceptional and excessive reporting across all major information channels. These hypes are of either direct or implicit interest for a broad range of different stakeholders and spread far, even worldwide, generating economic impacts (Shiller, 2017). Besides the effects of single hypes on economies, it is particularly interesting for academics and financial market participants to understand the emergence of hyping topics. Furthermore, to better understand the dynamics of arising hypes, different kinds of information channels, their dependencies and related feedback or self-enforcing effects need to be investigated. Nohuddin et al. (2012) address the dynamics of trending topics in their study by developing a method to identify trends as well as to analyze relationships and changes of trends in social media. In addition, Kristoufek (2013) analyzes the impact of search queries and Wikipedia visits (information channels) on the Bitcoin price (hype indicator) and finds a bidirectional relationship between the search queries and the Bitcoin price.

The goal of this master thesis is to design, implement and evaluate a machine learning model that detects and reveals patterns of trending topics which end up to hype (e.g. “Bitcoin”, “Sustainability”, “Artificial Intelligence”, “Corona Virus”, etc.) across diverse information channels. Besides major information channels or communication media like newspapers or online social networks, research studies and search patterns on popular search engines are a valuable source for identifying trending topics and will be investigated. Therefore, the student is expected to give a comprehensive and structured literature overview about hype characteristics and the detection and prediction of hypes. Following, as a proxy of the above mentioned information and communication channels, data like Google search volume, newspapers, SSRN mentions and online social network (OSN) activity of Twitter, Facebook, etc. need to be collected by the student with active support by the supervisor (all necessary scrapers will be provided). Next, the data set needs to be analyzed by the student applying a suitable empirical method (e.g. a machine learning model) to detect trending topics. After the detection, the information channels should be investigated regarding their interconnectivity and interaction to each other. Possibly, in a further analysis, the pattern detection as well as the understanding about the interconnectivity of the information channels can be applied to predict trending topics. The student is expected to have strong interest in programming and empirical modeling as well as dealing with large amounts of data.

**Supervisor:** Micha Bender

## Literature:

- Caulfield, T., & Condit, C. (2012). Science and the sources of hype. *Public Health Genomics*, 15(3-4), 209-217.
- Kristoufek, L. (2013). BitCoin meets Google Trends and Wikipedia: Quantifying the relationship between phenomena of the Internet era. *Scientific reports*, 3, 3415.
- Nohuddin, P. N., Coenen, F., Christley, R., Setzkorn, C., Patel, Y., & Williams, S. (2012). Finding “interesting” trends in social networks using frequent pattern mining and self-organizing maps. *Knowledge-Based Systems*, 29, 104-113.
- Shiller, R. J. (2017). Narrative economics. *American Economic Review*, 107(4), 967-1004.
- Vasterman, P. L. (2005). Media-hype: Self-reinforcing news waves, journalistic standards and the construction of social problems. *European Journal of Communication*, 20(4), 508-530.