Internship Project

Topic: Content-Based Influence Maximization by the Linear Threshold Model
Advisor: *Panos Karras (panos@cs.au.dk)*

Description:
How can a message best spread in a network after we share it with friends and followers? What if the desired effect requires the simultaneous spread of several messages? How can we improve our performance on such tasks in an online manner, learning from experience? Significant research activity has been dedicated to the problem of strategically selecting a seed set of initial adopters so as to maximize a message's spread in a network. Yet this line of work assumes that the success of such a campaign depends solely on the choice of a tunable seed set of adopters, regardless of how users perceive the propagated meme, which is fixed. Yet in many real-world settings, the opposite holds: a meme's propagation depends on users' perceptions of its tunable characteristics, while the set of initiators is fixed.
In this project, you will build on previous work on the problem that arises in such circumstances: find the optimal content characteristics for a creative promotion campaign, to maximize its expected spread over a social network, pursuing two breakthroughs:

1. Addressing the problem by a popular model for information diffusion in networks, the linear threshold model.
2. Handling the case in which the propagated message consists of multiple parts, which need to be allocated to initial propagators.

You will develop novel solutions, build on top of an existing code base, develop new code, collect data, and conduct experiments. This outcome of this work will be publishable.

Related work:

1. Amit Goyal, Wei Lu, Laks V. S. Lakshmanan: SIMPATH: An Efficient Algorithm for Influence Maximization under the Linear Threshold Model. ICDM 2011
2. Sergei Ivanov, Konstantinos Theocharidis, Manolis Terrovitis, Panagiotis Karras: Content Recommendation for Viral Social Influence. SIGIR 2017

Requirements:

1. Self-motivation to do research.
2. Comfortable with C++, python, handling large data sets.
3. Strong background in linear algebra and probability theory.
4. Attention to detail.