Team member: Stephanie Sha, Jason Jia, Maria Besedovskaya, Pavena Vongkhammi

# Project Proposal

**Problem:** How should small and medium businesses (SMBs) allocate short-form marketing spend and content-creation efforts across Tiktok, Instagram Reels and Youtube Shorts?
**Topic:** Cross-channel short-form video marketing / content-creation resource allocation for SMB

**Motivation**
Deciding how to allocate marketing spend and how much effort to spend creating content across different social media channels is critical to the success of a business. But:

1. Most small firms cannot afford to hire marketing analysts or marketing agencies. Even if they can, they might not have enough internal data for analysis.
2. BigTechs have excellent performance measurement systems, but only within their ecosystem. Firms do not know how they should split marketing spend across social media platforms.
3. Not as much research has been done on short-form videos, which are relatively recent compared to TV, newspapers and search. However, they are becoming one of the most important channels for advertisers.

**Data Sources**
To get a measure of social media engagement, we want to collect the following information for 100-500 businesses:

- Firm social media metrics (e.g. number of followers, number of likes, number of views, number of bookmarks, number of shares, age of account, number of posts)
- Firm characteristics (e.g. industry, products, age of company, country, firm awareness by google search, number of stores, number of employees, revenue)

To link social media engagement with return on ad spend, we want to collect the following information (if possible):

- Ad views
- If no such data is available, we can also work with predicting future social engagement metrics based on current social media engagement metrics. We can then use some broad numbers from, say, consultancy reports to give a rough estimate of the potential gains.

**Analytic techniques**

- Ensembles (XGBoost, LightGBM) + Regressions (ridge, LASSO) + Multi-armed bandits

The general idea is to run the following model:

- [Future social media engagement metrics / return on ad spend] ~ [firm social media engagement metrics] + [firm characteristics]

Then, given that we get a metric for each channel, e.g. (r1, r2, r3), we want to map that to a distribution (s1, s2, s3). One way is to find the largest r_i and assign 100% of resources to that, but we think there are benefits to diversification. Another way is to assign shares of spending proportional to the ROAS for each channel. But to be able to determine the **optimal** marketing allocation, we need to make some statistical assumptions and find a reasonable way of doing that.

**The impact or overall goal of the project**
It would be able to say that the optimal marketing spend allocation results in x% higher social media engagement and y% higher return on ad spend compared to the baseline allocation. It would recommend a data-driven marketing strategy for SMBs that is likely better than a random guess based on priors, or equal allocation. It might even recommend SMBs to consider marketing in channels they have not previously explored.