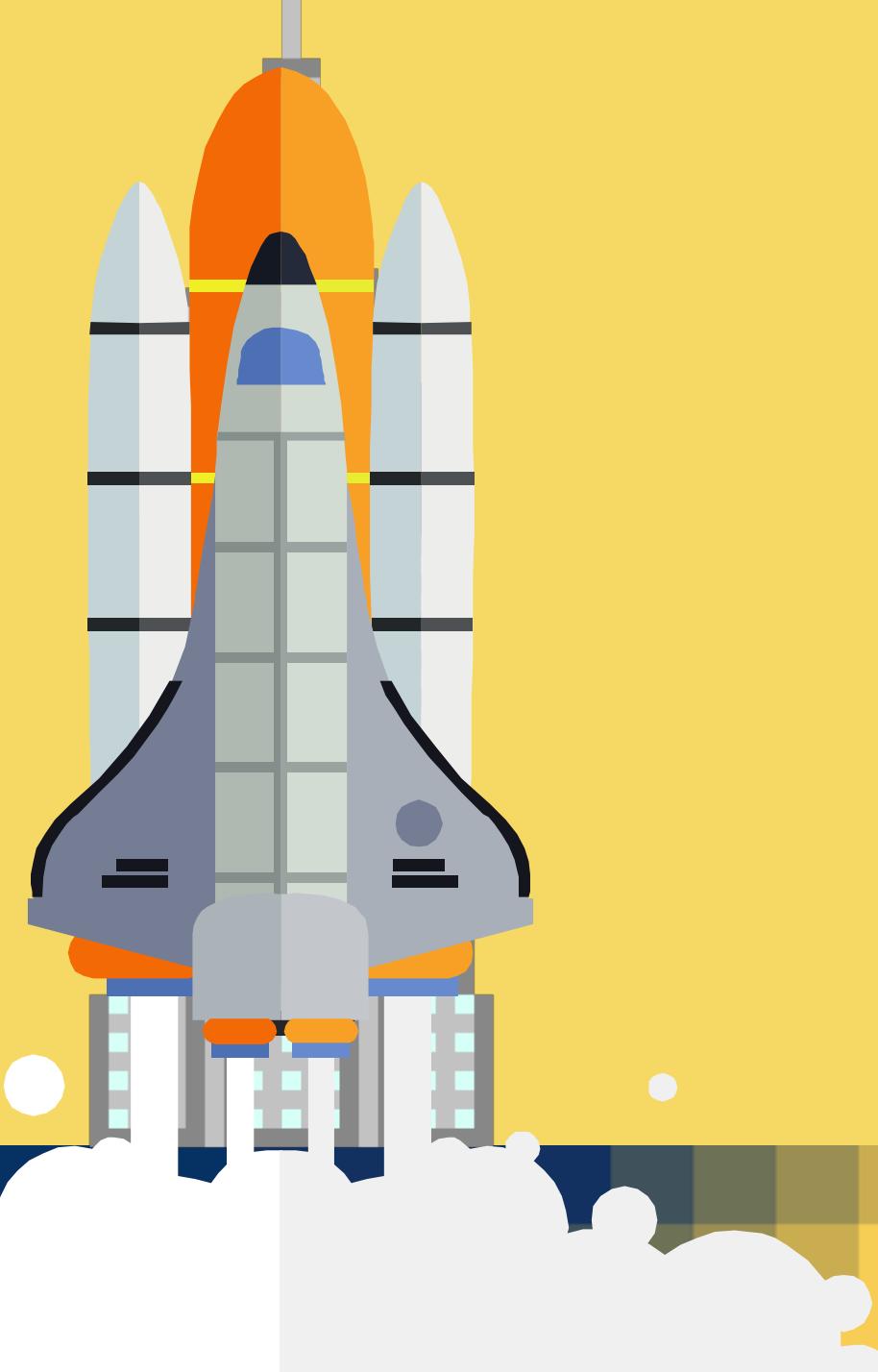


Startups: How they did it!

A Data Analysis of Venture Capital
Funding

Sean Gallen & Jack Gallagher



University College Dublin
An Coláiste Ollscoile, Baile Átha Cliath

Presentation Outline

1. Brief Introduction and motivations behind this project
2. Ethical Considerations
3. Evaluation/Results
4. Reproducibility
5. Conclusion and Future Work



Brief Introduction



RQ1: How does the correlation between a company's location and industry impact the amount of funding a company receives?



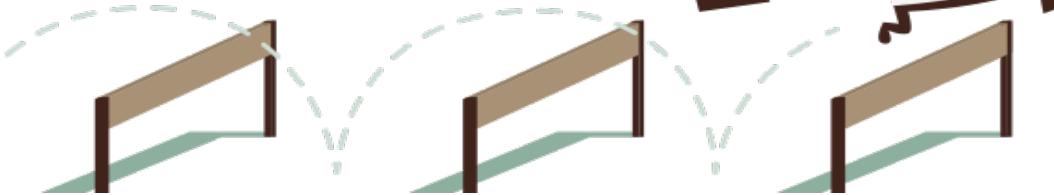
RQ2: How does founders education affect the funding their company receives?



RQ3: Do founders with previous experience earn more funding than founders with no previous experience?



Motivations:



- Extremely topical - huge growth in funding worldwide...
\$164Billion invested by VC funds in 2017
- We both have a **huge interest** in startups - Grabbing news headlines worldwide
- Practical project for us with a link to the real world - allows us have a look into the key aspects of a **great startup**



Ethical Considerations

- We obtained the data from CrunchBase under a number of conditions:
 - Most notably that we would not release, or use the data commercially
- The dataset anonymized institution IDs:
 - We decoded the top 10 institutions for clarity in our results
- The dataset provided non-anonymized founder names:
 - We didn't find it necessary to anonymize these names as they are publically available



Datasets & Data Preparation



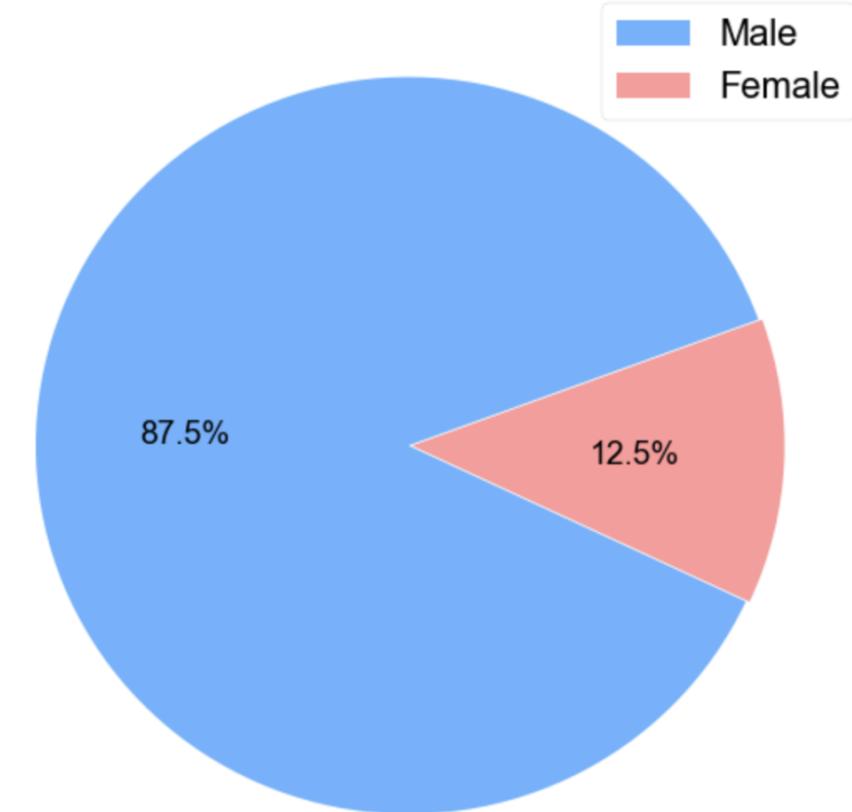
- We initially had access to 9 datasets (Organisations, funding, jobs etc.)
- We prepared two main datasets:
 - Founders information and brief startup information
 - Purely startup information e.g Industry, funding etc.
- Merging, Text manipulation, Transformations of columns
- Time consuming - effected timing of project

Insight into our data:



- ~40,000 founders and organizations
- Details include: (1) Founders education details
(2) Organisation details
- **7 times** as many male startup founders than there are Female
- Average funding level for - USA: **\$25,299,057**
- UK: **\$16,318,734**
- IRL: **\$22,450,510**

Startup Founders by Gender

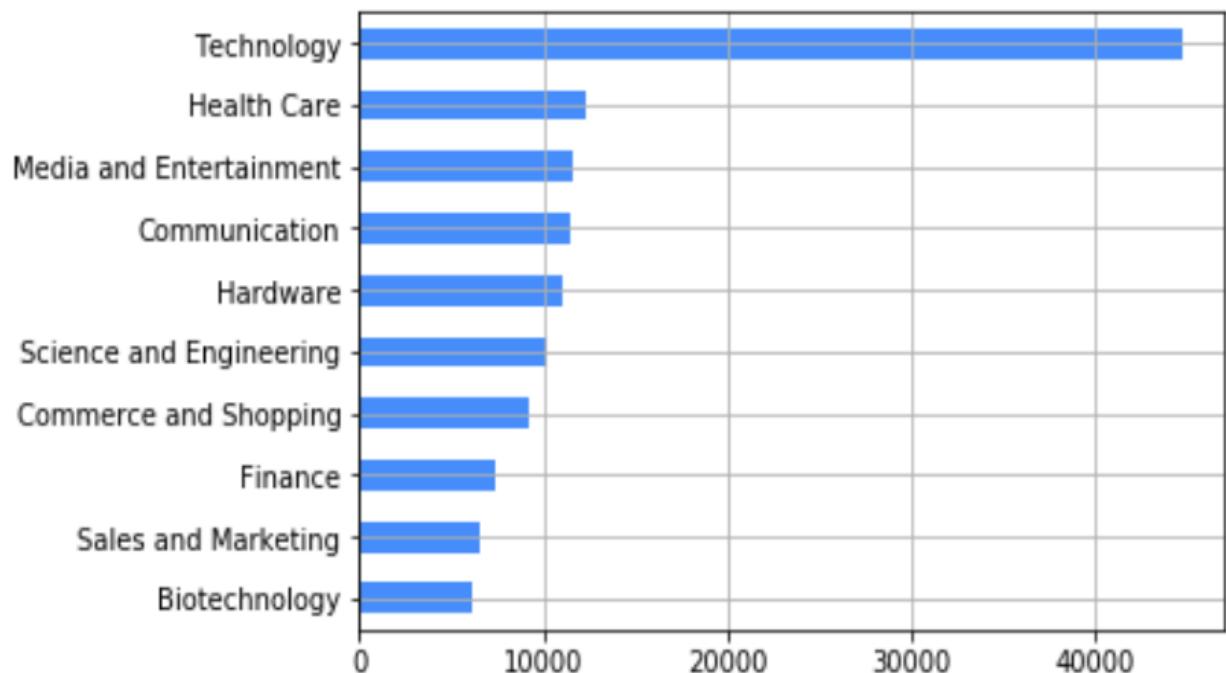


Pacman?

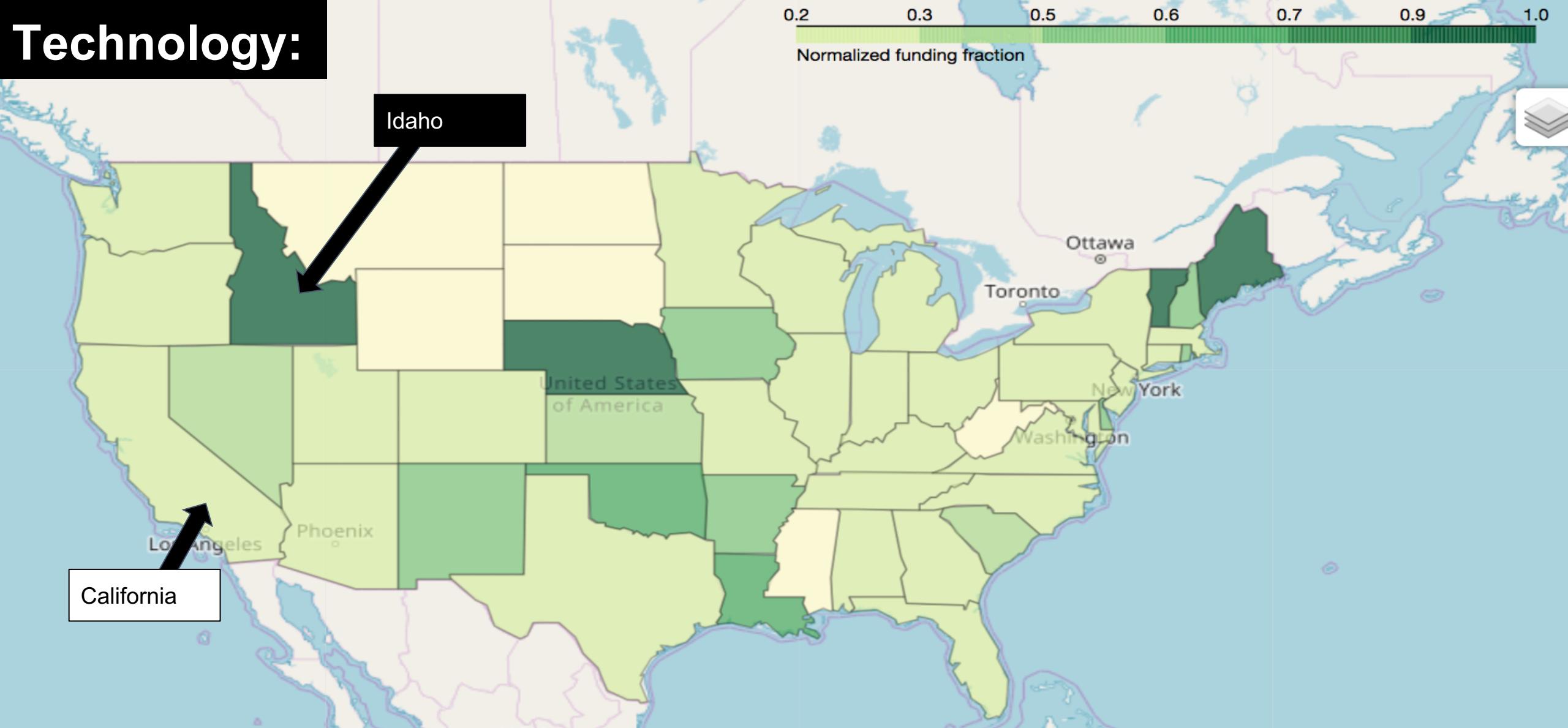
RQ1: How Location and Industry affect Funding



- Focused on three countries:
USA, UK, Ireland
- Normalized funding values
- Compared each country using
these values
- Three top industries:
 - Technology
 - Health Care
 - Media and Entertainment



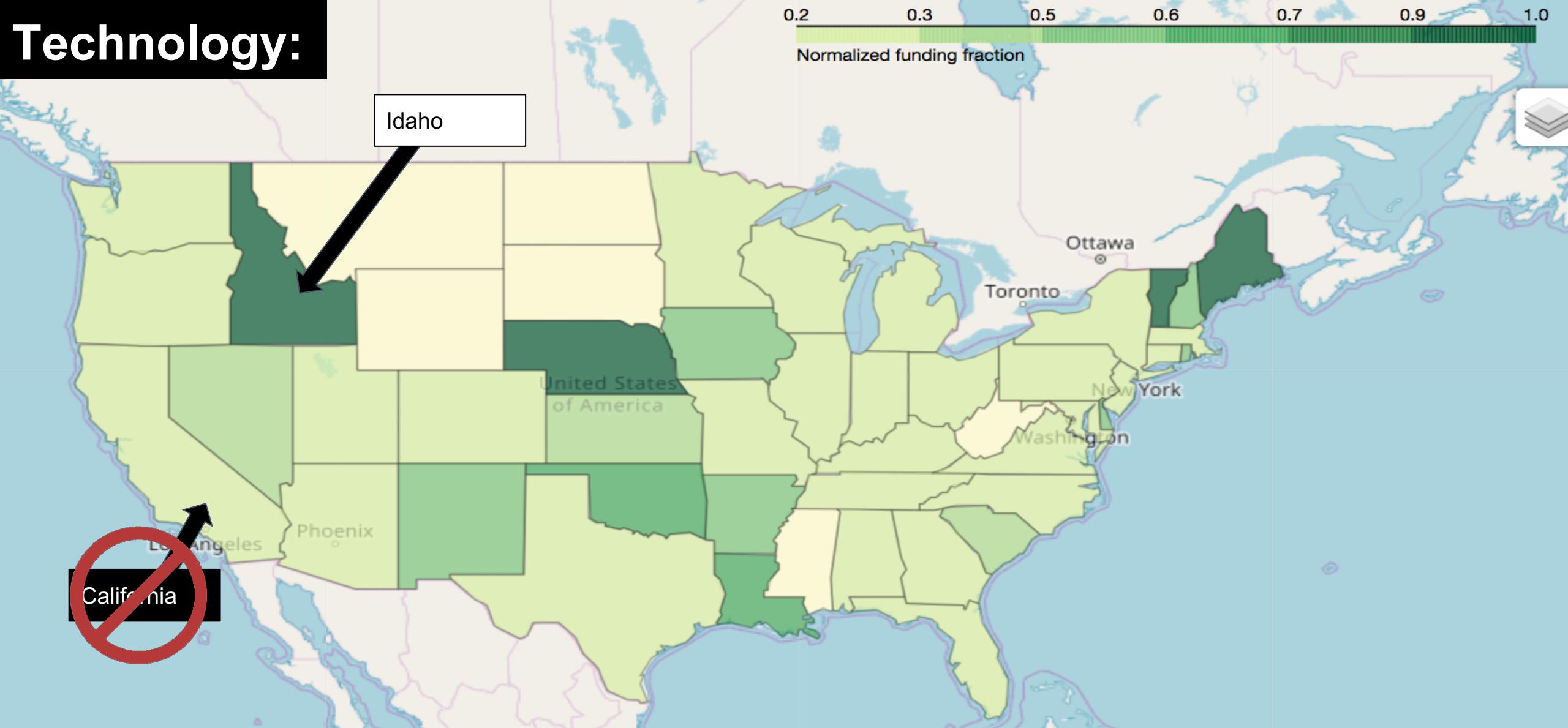
Technology:



University College Dublin
An Coláiste Ollscoile, Baile Átha Cliath



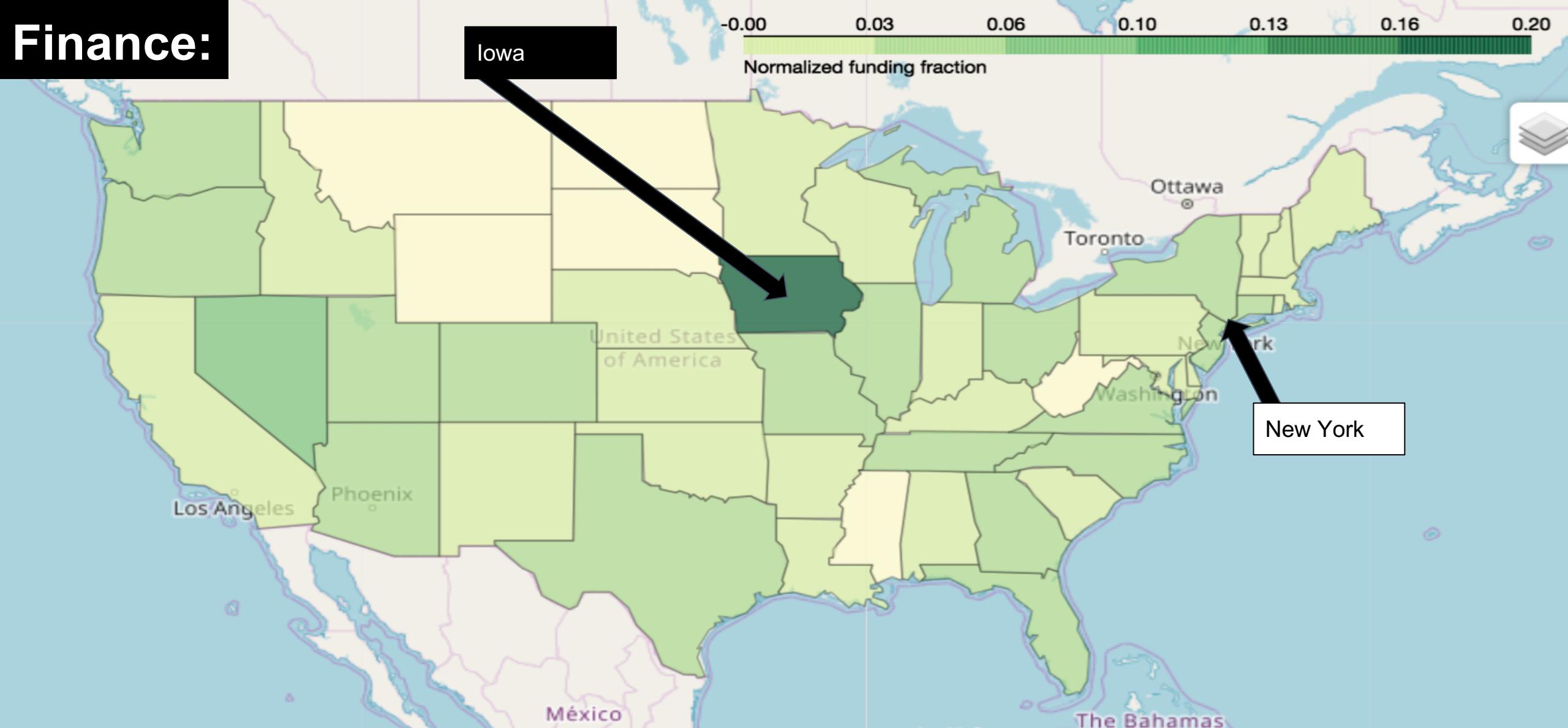
Technology:



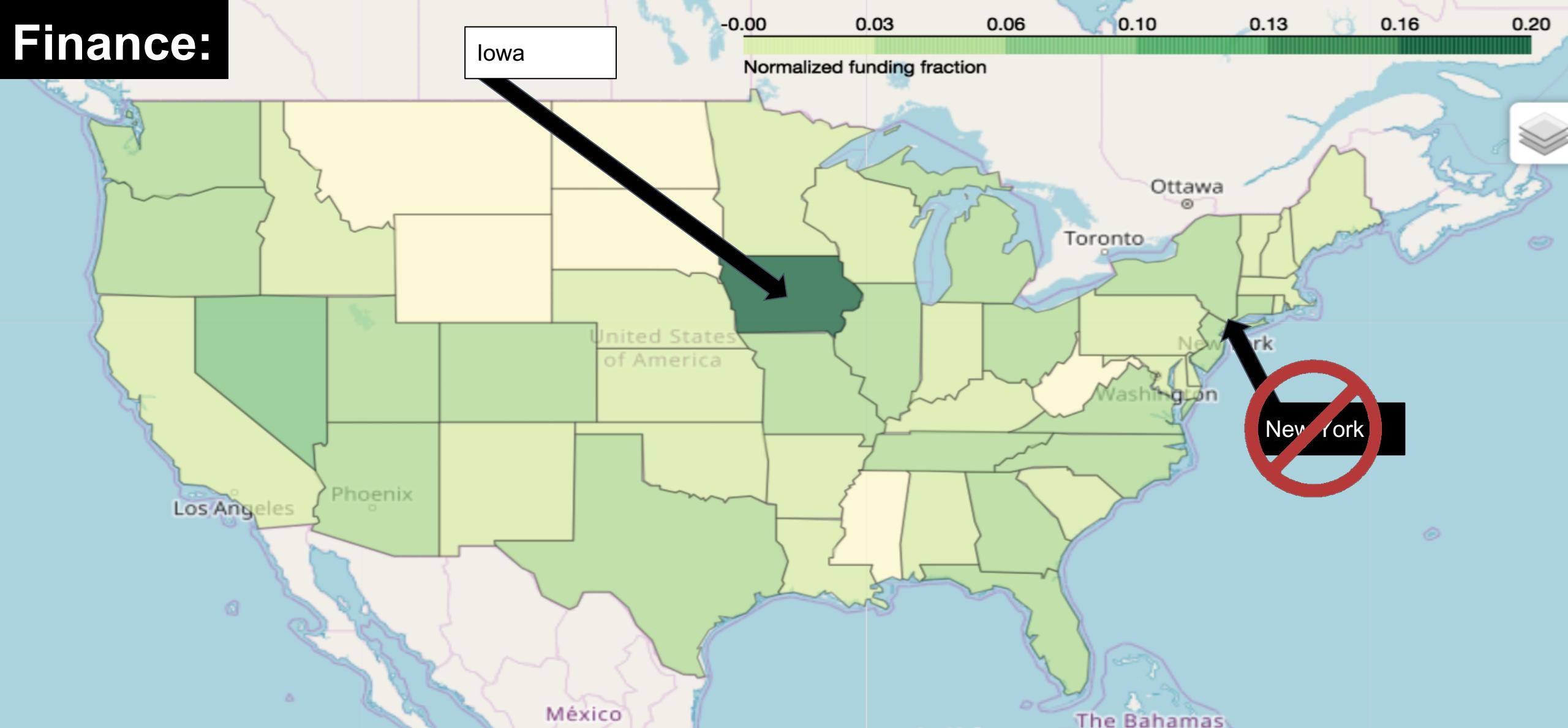
University College Dublin
An Coláiste Ollscoile, Baile Átha Cliath



Finance:



Finance:





RQ1: Conclusion

- As shown in the heatmaps it is clear that the location of a company has an impact on the funding received:
 - This is shown by the strength of the colours in the heat maps shown
- It is also clear that the industry has an impact on the amount received in each state.
 - This is shown by looking at the contrasting heat maps

RQ2: Insight into a Founders Education

- We split the startups into three categories based on the following funding intervals:
 - Less than or equal to 1 Million USD
 - Between 1 Million to 10 Million USD
 - Greater than 10 Million USD
- We looked at the founders education in terms of:
 - Highest Degree achieved and Institution attended



RQ2: Insight into a Founders Education



Highest Degree Ranking:

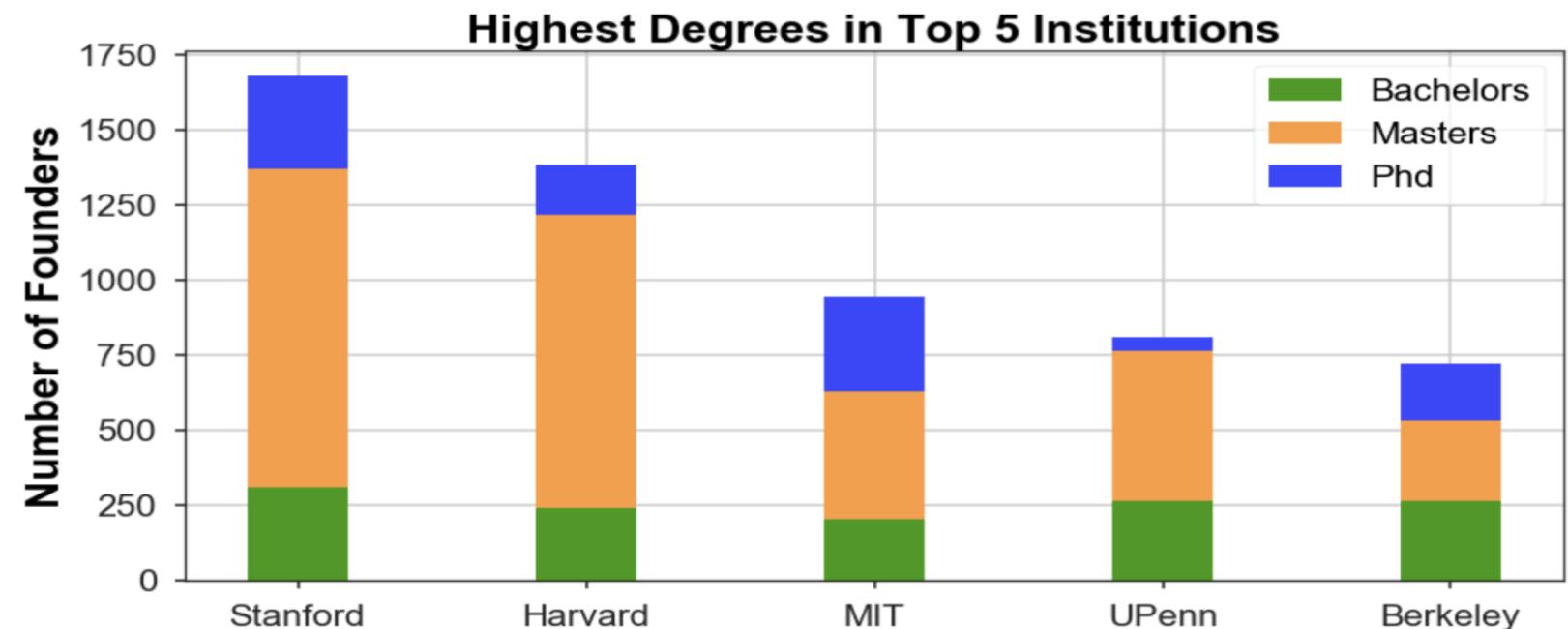
1. PhD
2. Doctorate
3. Executive
4. Masters
5. Juris (Law)
6. Honors
7. Bachelors
8. Diploma
9. Certificate

- Focusing on top 3 most popular degree types:
 - Bachelors, Masters, PhD

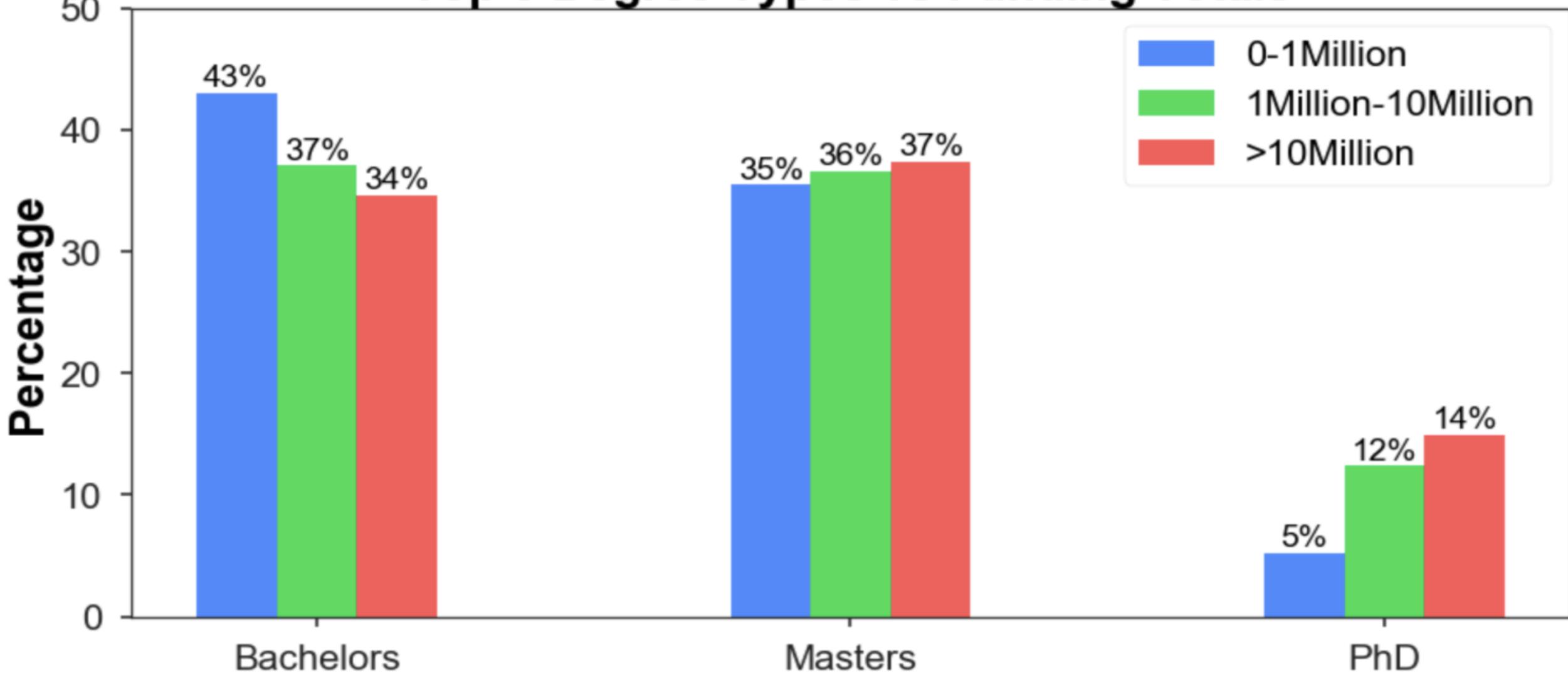
RQ2: Insight into a Founders Education

- Five most popular Institutions attended by startup founders in our dataset:

1. Stanford
2. Harvard
3. MIT
4. UPenn
5. Berkeley



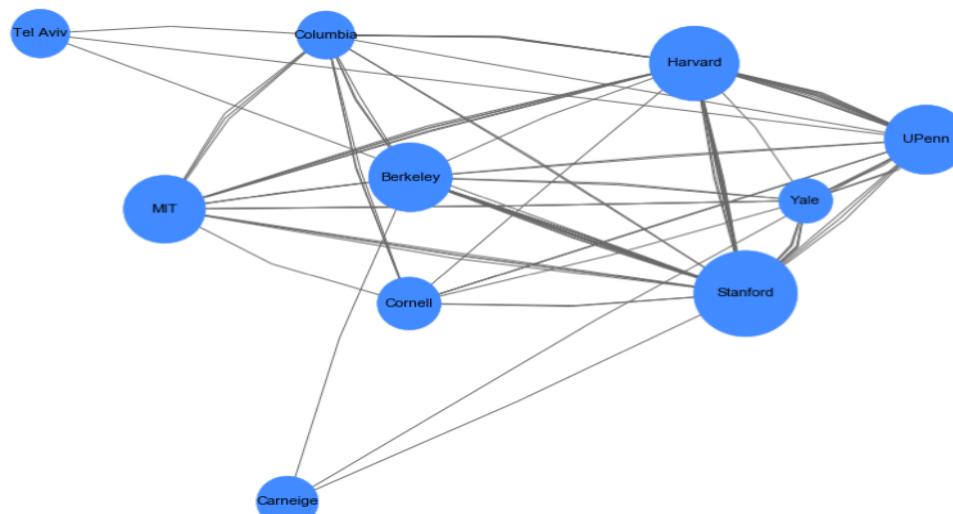
Top 3 Degree Types vs Funding Totals



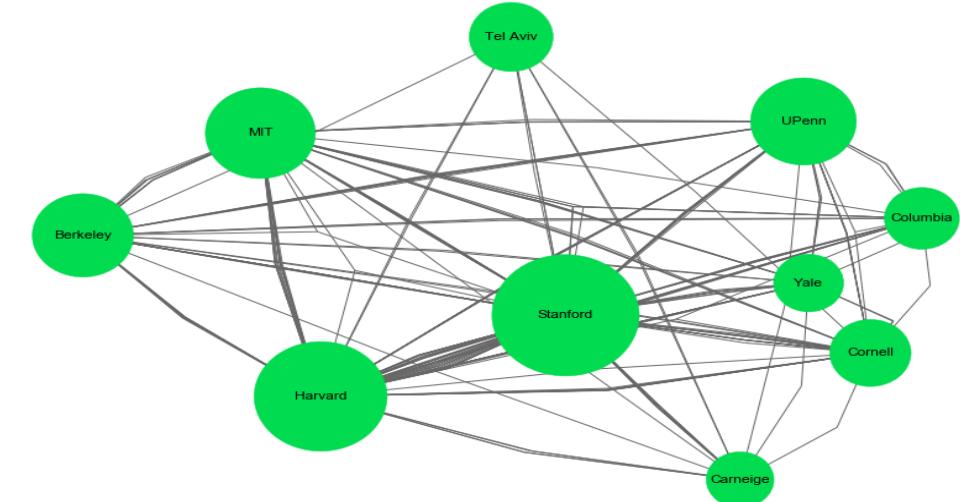
University College Dublin
An Coláiste Ollscoile, Baile Átha Cliath

RQ2: Insight into a Founders Education

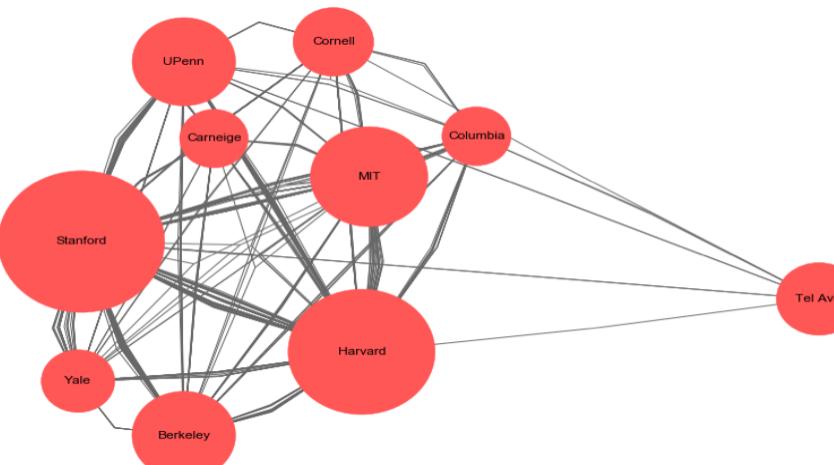
Network of Top 10 institutions for Founders (0-1Million)



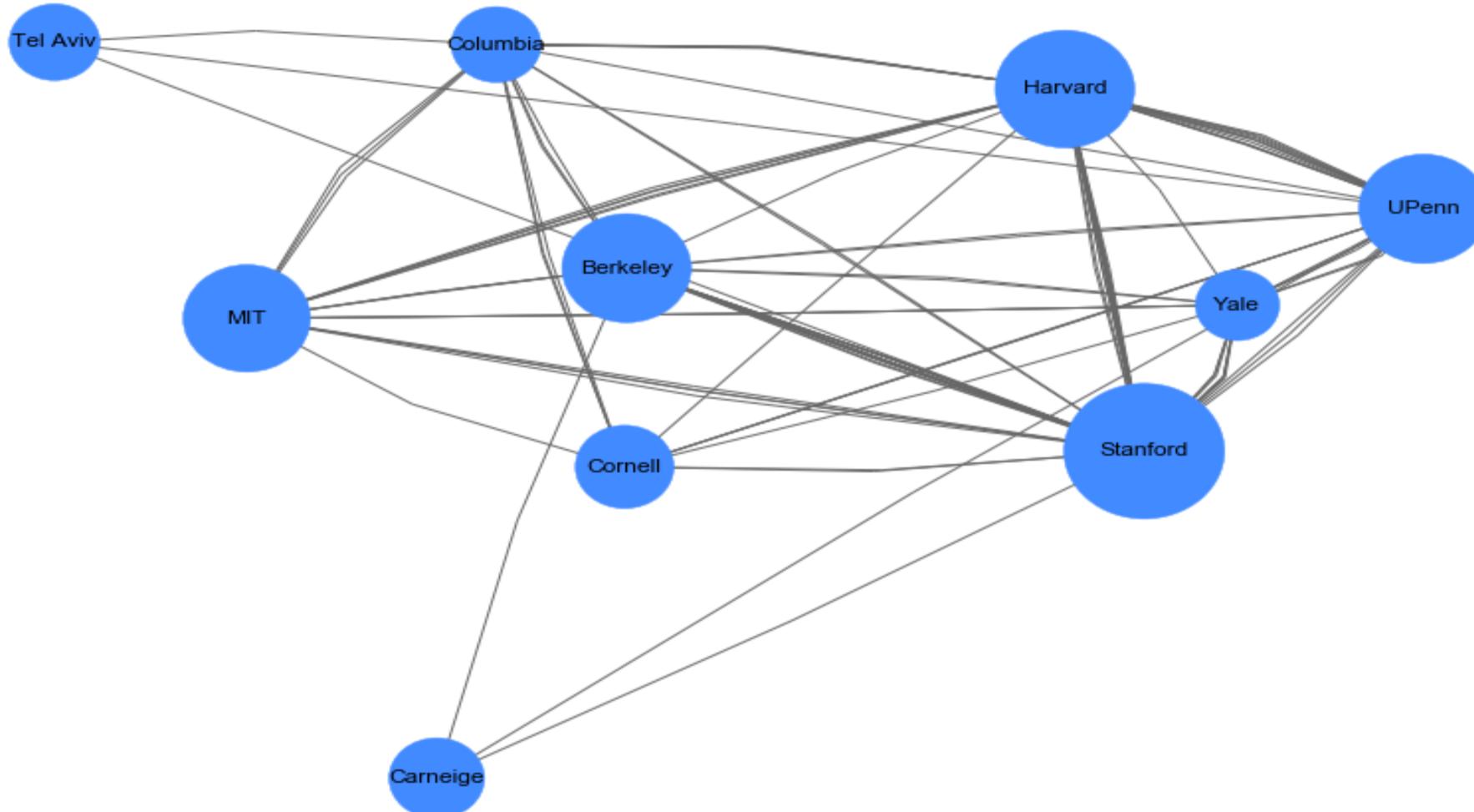
Network of Top 10 institutions for Founders (1Million-10Million)



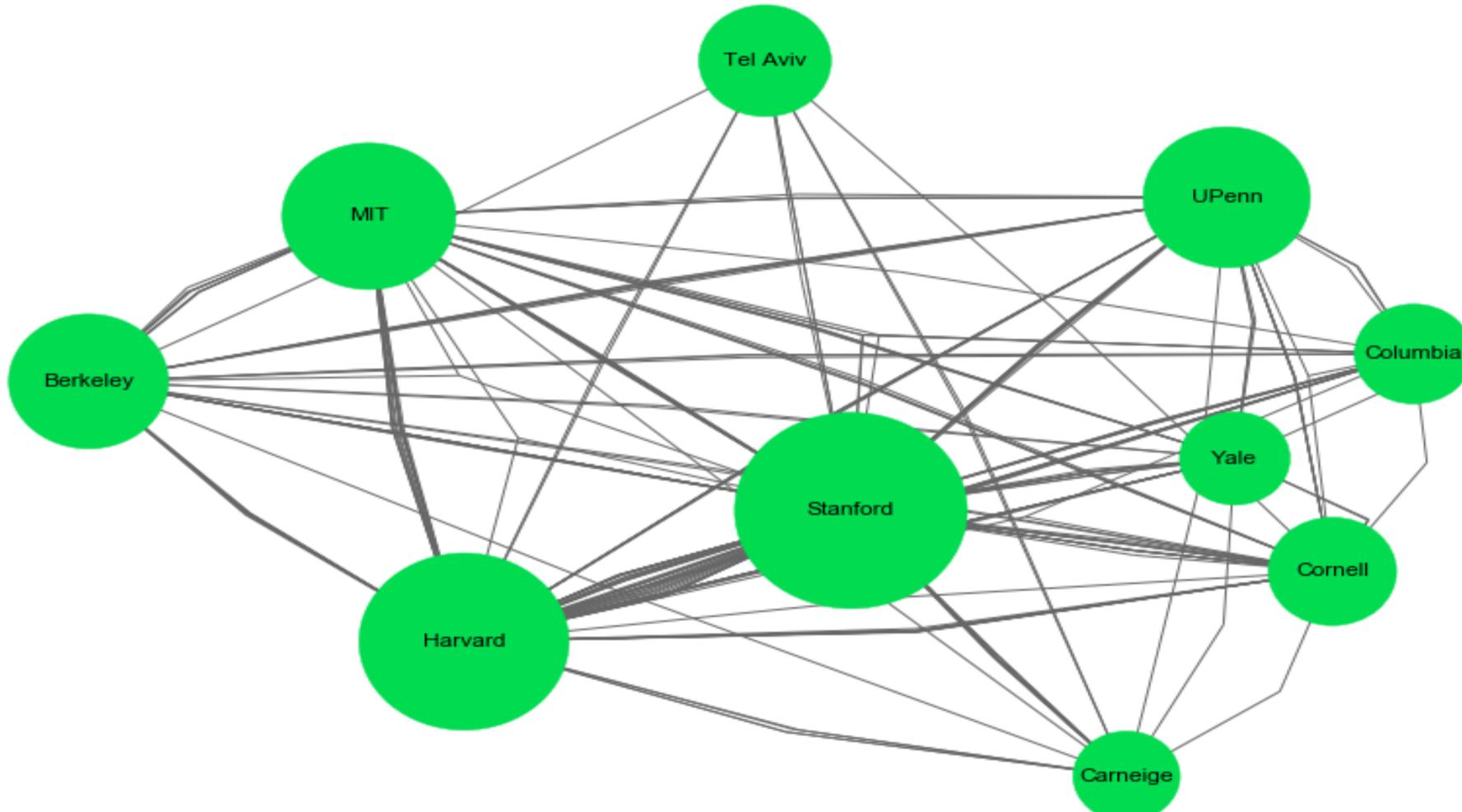
Network of Top 10 institutions for Founders (>10Million)



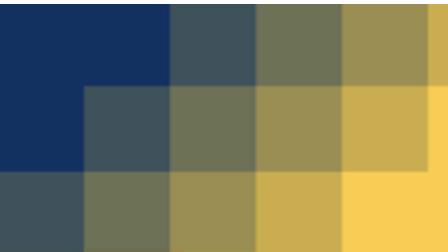
Network of Top 10 institutions for Founders (0-1Million)



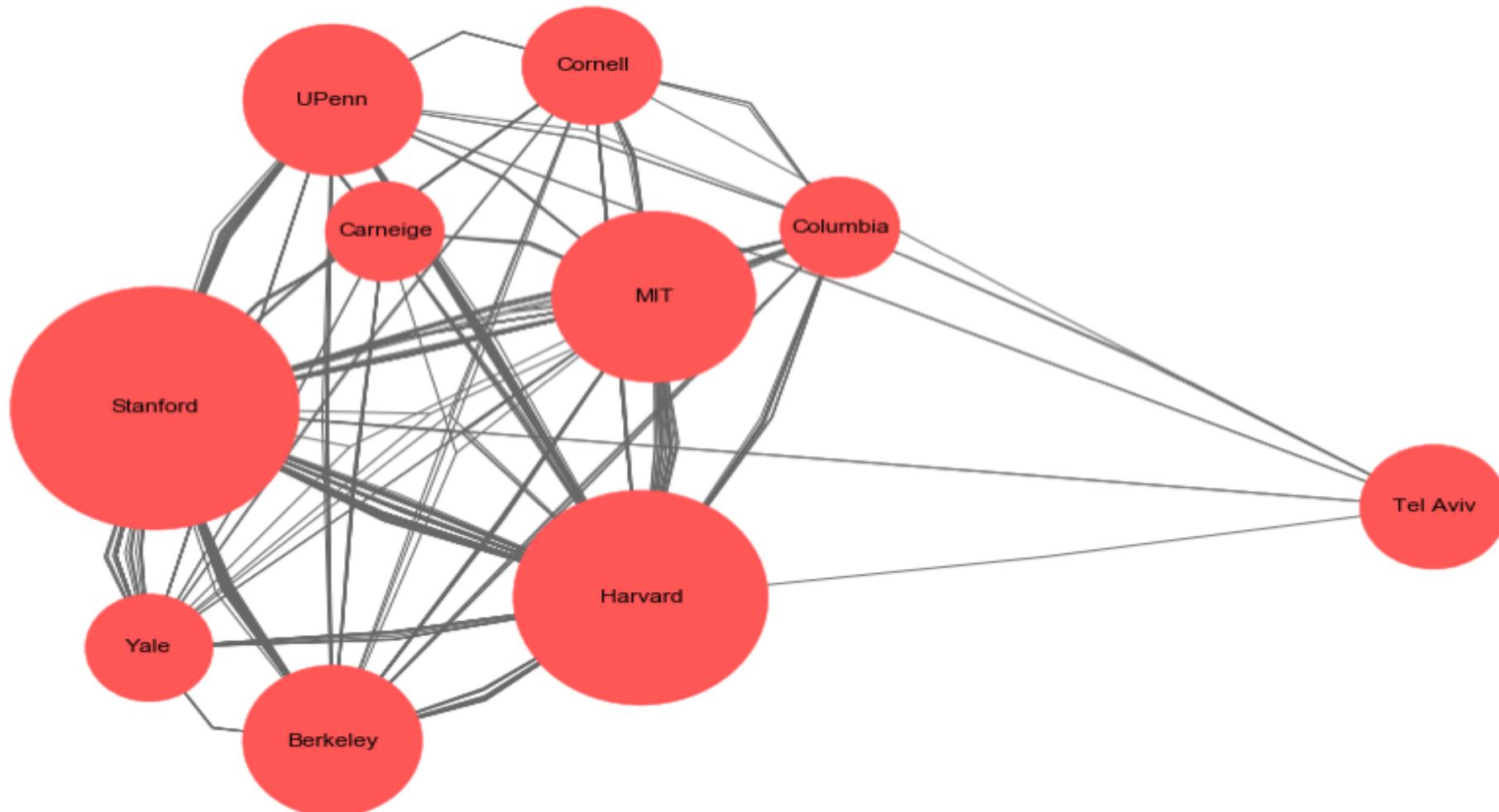
Network of Top 10 institutions for Founders (1Million-10Million)



University College Dublin
An Coláiste Ollscoile, Baile Átha Cliath



Network of Top 10 institutions for Founders (>10Million)

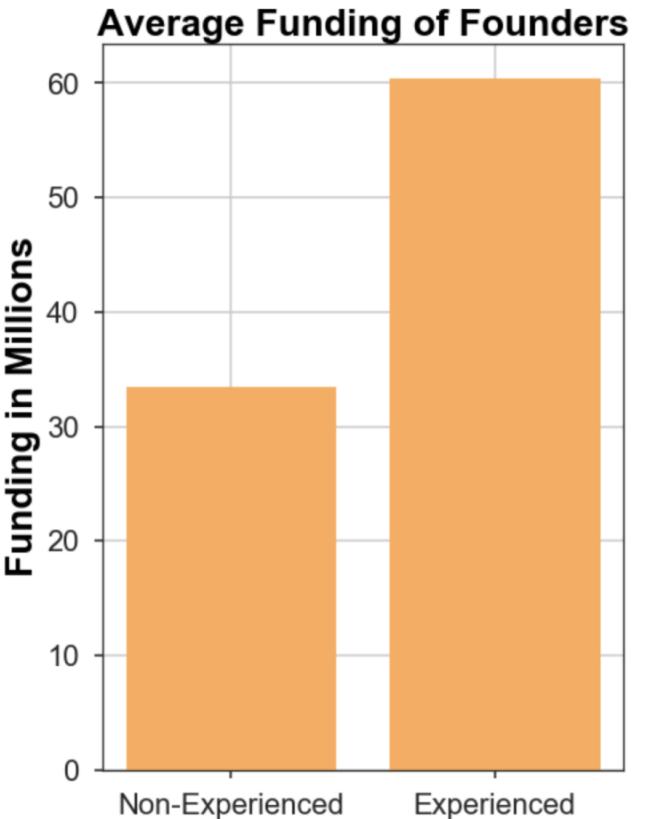




RQ3: Does past experience of a founder affect funding received



- Experienced Founders = founded more than 1 startup
- Explored if the average funding of a founder with experience *differs* from that of a founder without experience



RQ3: Why it didn't work?!

- Large funding range
- Intervals - Sample size **too small**
- Without funding intervals = **Accuracy distorted**
- **Time** - Data Preparation



Reproducibility



- Ensured all results reproducible for potential future work on this topic
- Documented all changes using markdown cells
- Took note of all python packages used and versions e.g NetworkX, Folium
- **Version Control** - Github - Outline key changes
- **Problem:** Can't ethically provide our original dataset, however, they can be accessed via CrunchBase

Potential Future Work



- More in depth insight into how the gender of a founder effects a startup
 - Even though there are more Male founders, does this mean they have a higher percentage of successful startups?
- Predictive analysis of how to build the perfect startup:
 - Best location for industry
 - Best institution to hire from for industry
 - Best venture capital fund to approach for funding
- Use our analysis and results for this potential future work

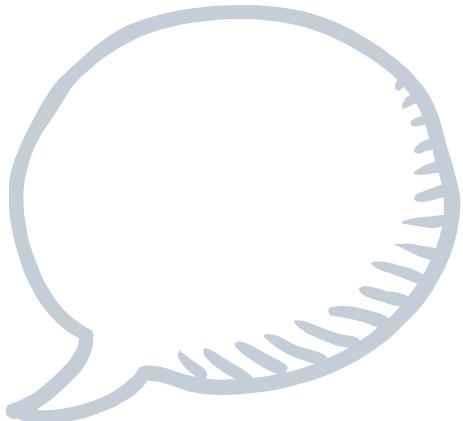


Conclusion



Research Questions:

- We found that industry and location does have an effect on funding
- We found that a founders education impacts funding received
- We found our third RQ was inconclusive



THANKS!

Any questions?