
USER ENGAGEMENT ANALYSIS FOR SMART BUILDINGS BASED ON SOCIAL TREND TRACKING

Jiao Jiao

Dr. Heike Brugger

Dr. Michael Behrisch

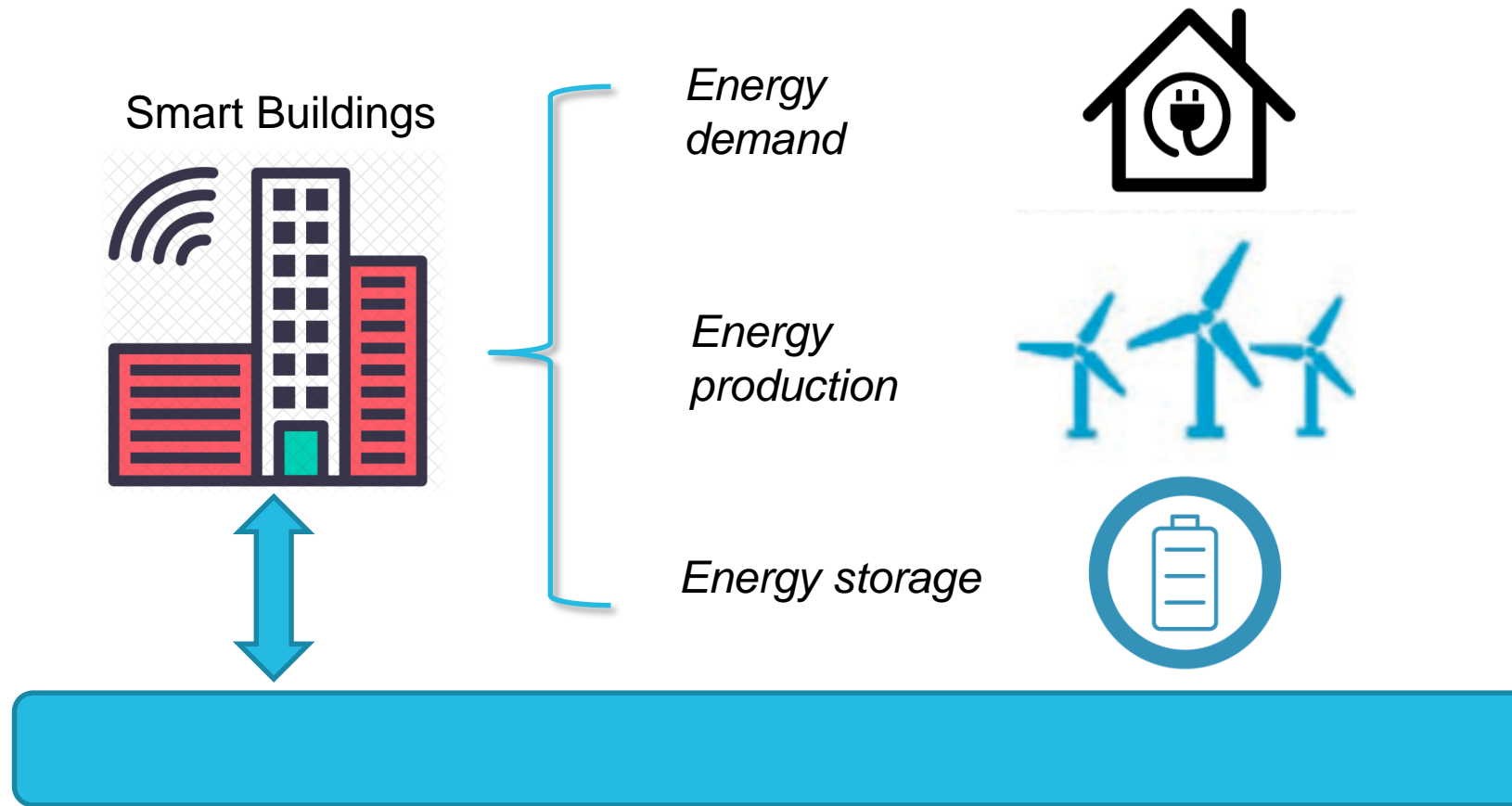
Prof. Dr. Wolfgang Eichhammer

Fraunhofer Institute for Systems and Innovation Research ISI

Utrecht University

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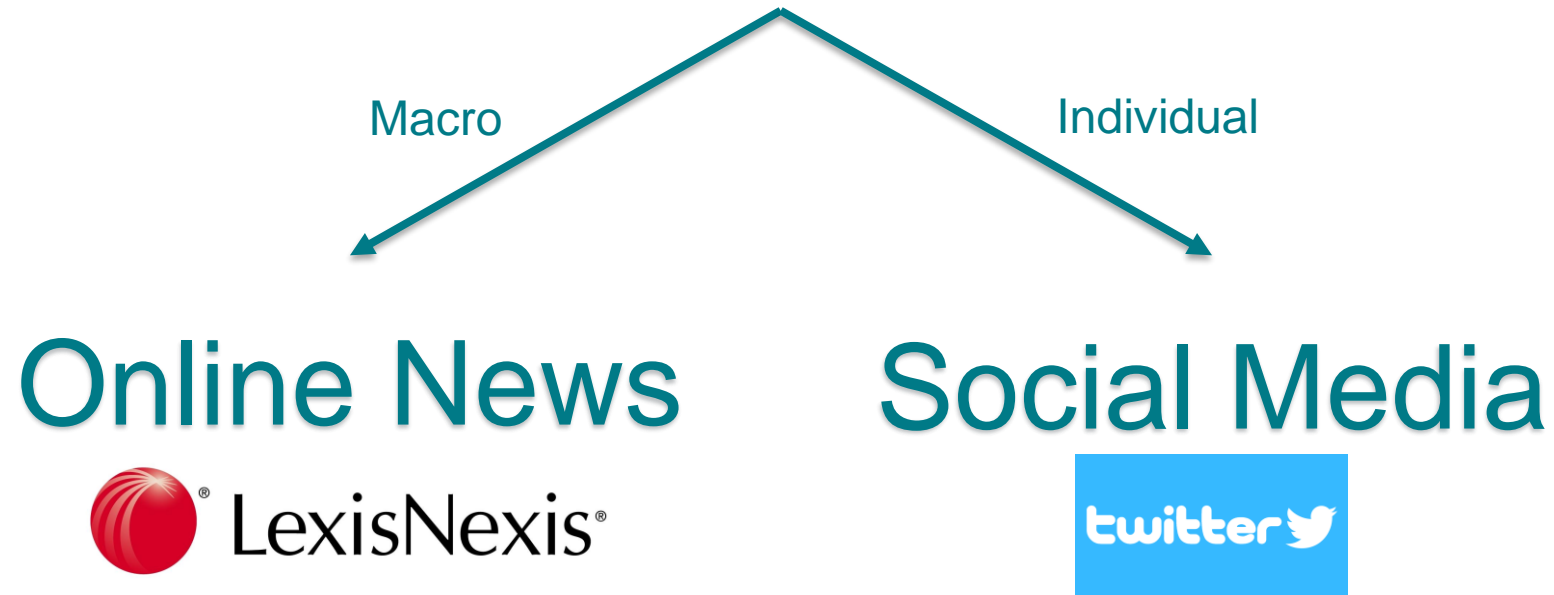
Why Smart Buildings



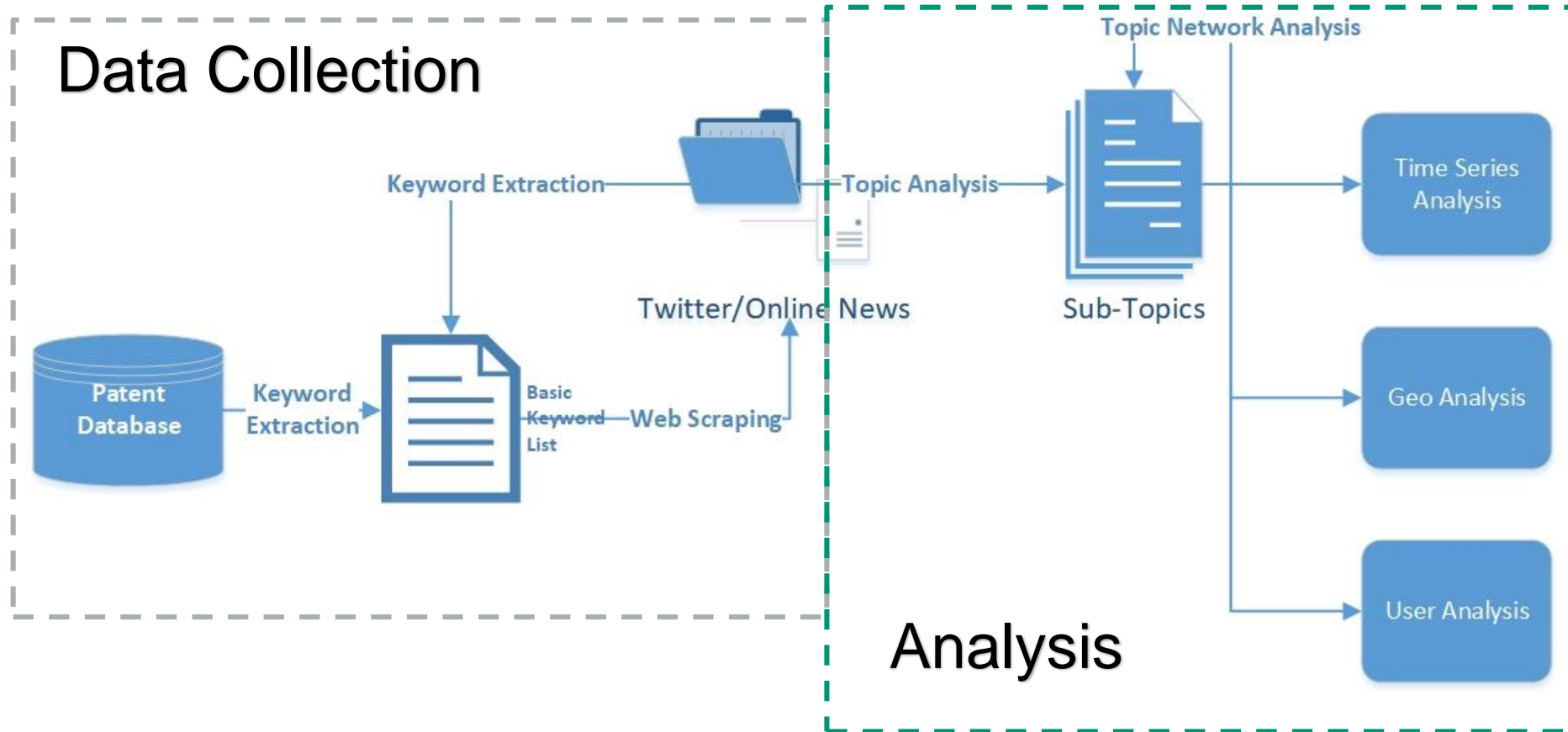
Why User-Generated Data + Visual Analysis

- Why user-generated data
 - At least millions of data within a narrowed concept
 - Without social-desirability bias
- Why visual analysis
 - Easy to understand a fuzzy concept
 - Efficiently and effectively represent the concept spreading over a long timeframe

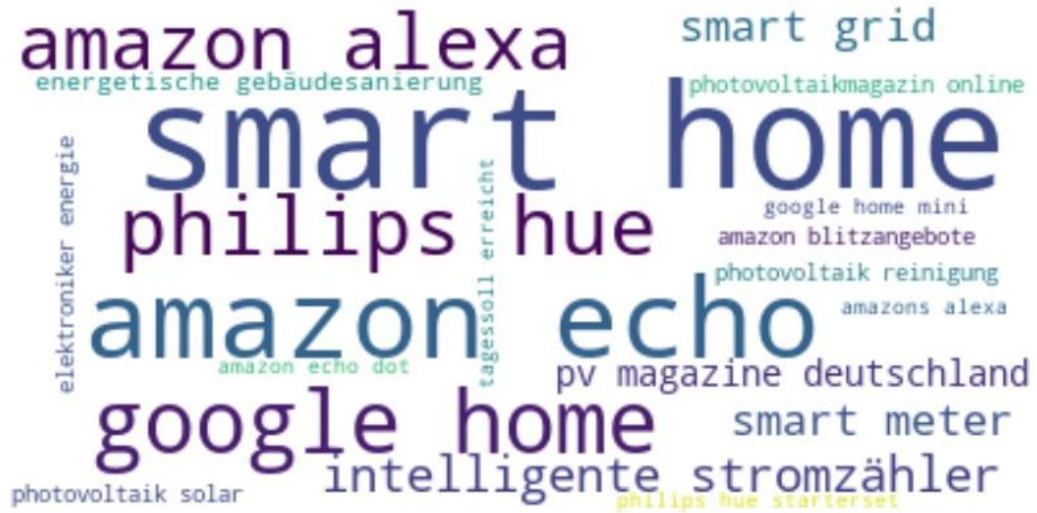
User-Generated Data



Framework



Keyword Analysis



Twitter:
Daily life-oriented/Technology-oriented
Spoken style

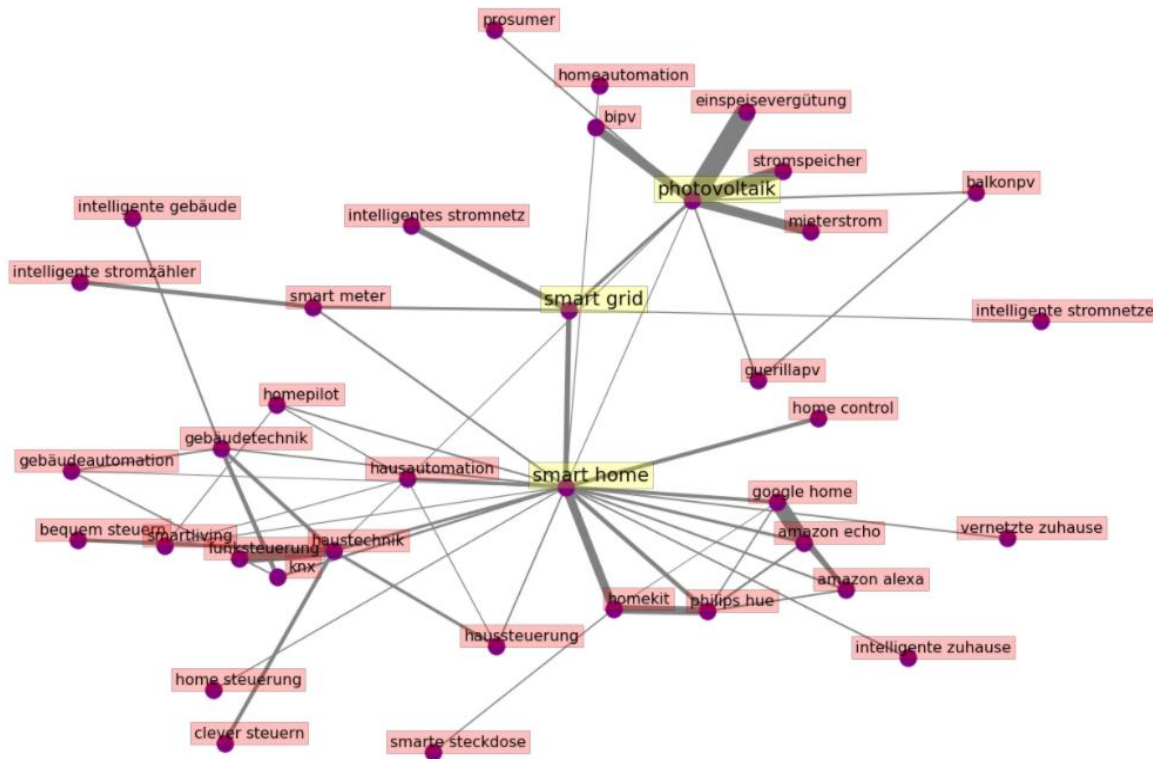
Spoken style



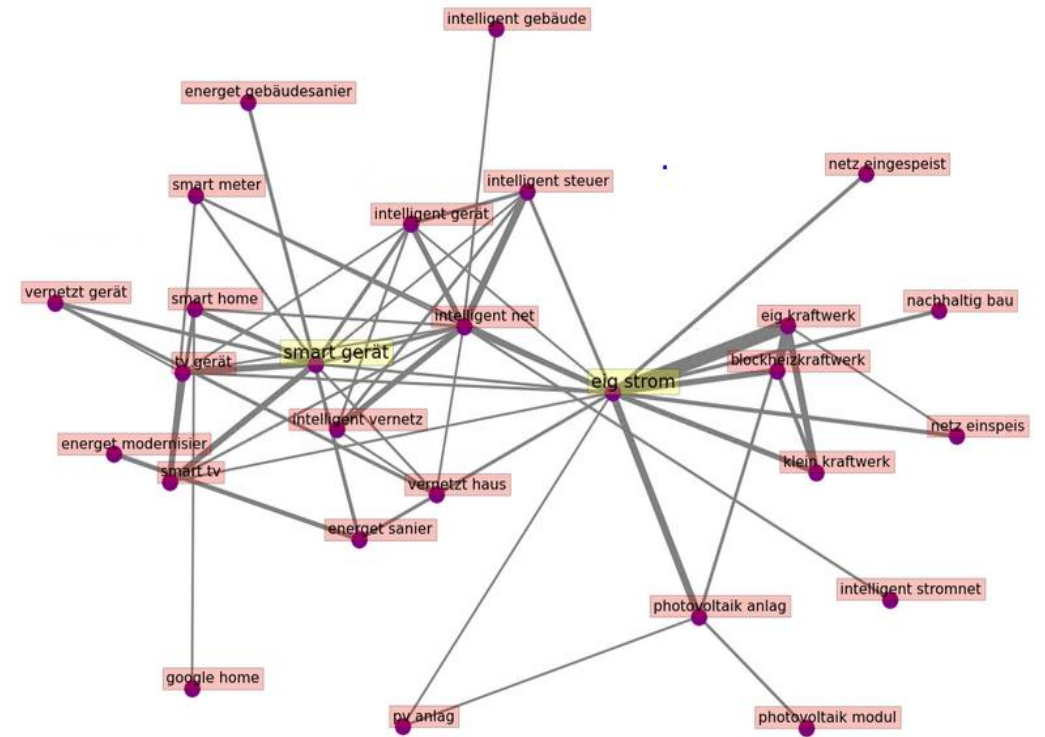
News:
Policy-oriented
Written style

Written style

Keyword Network Analysis

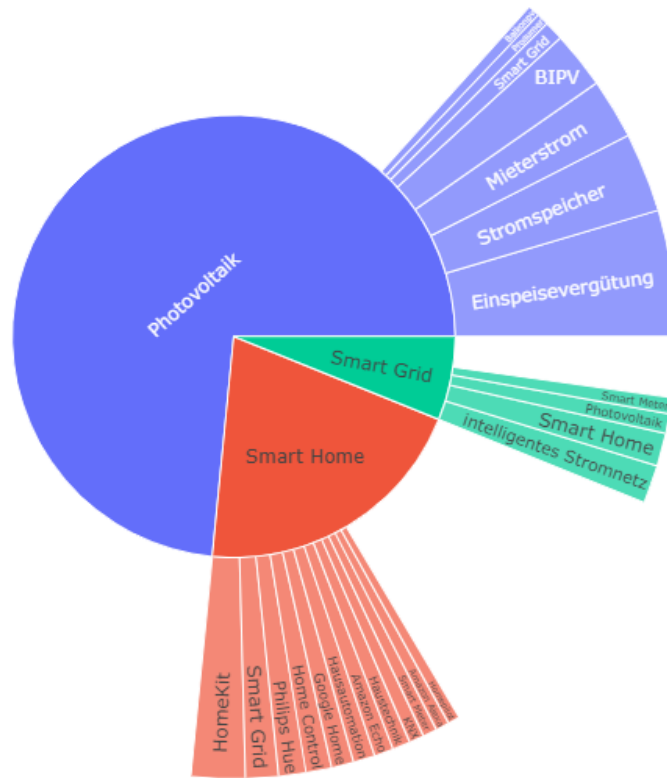


Twitter

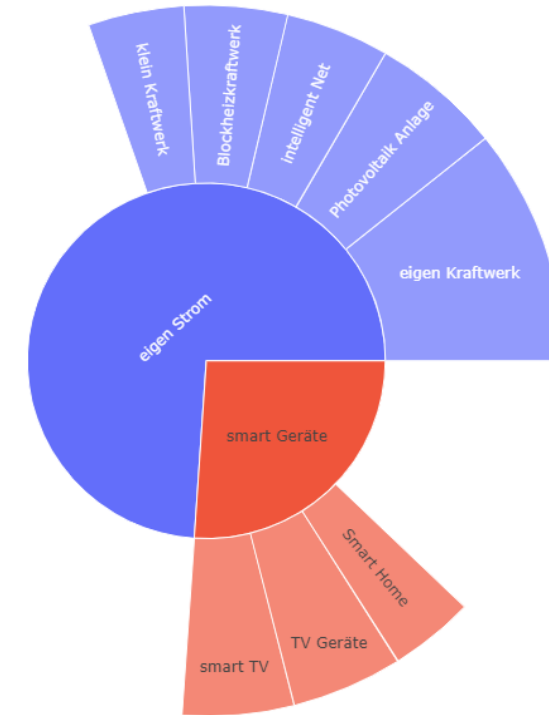


News

Topic Analysis

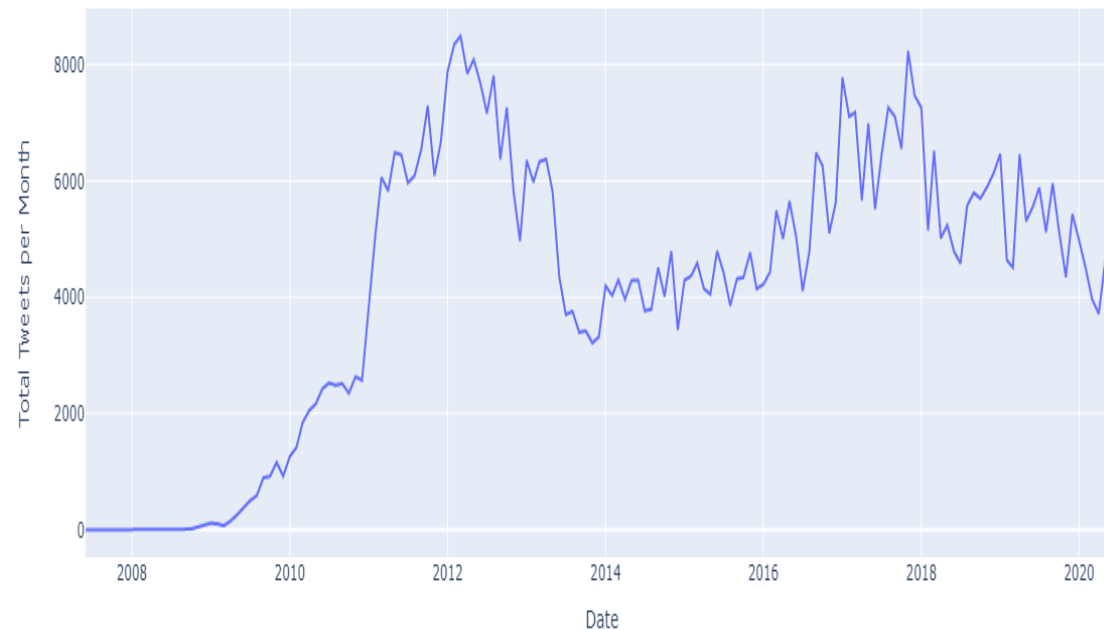


Twitter

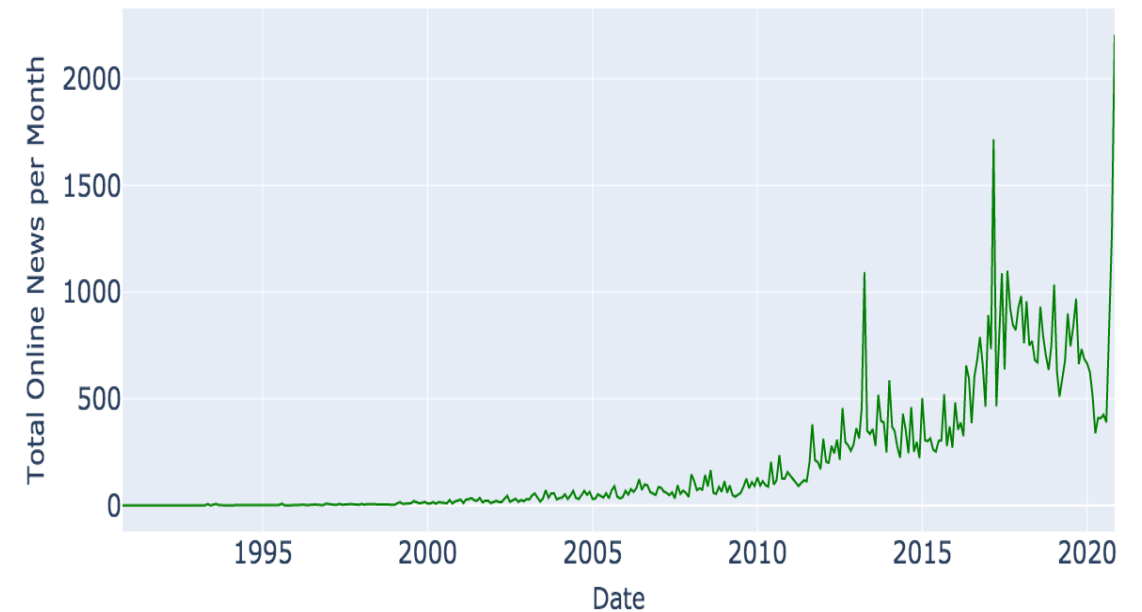


News

Temporal Diffusion Analysis

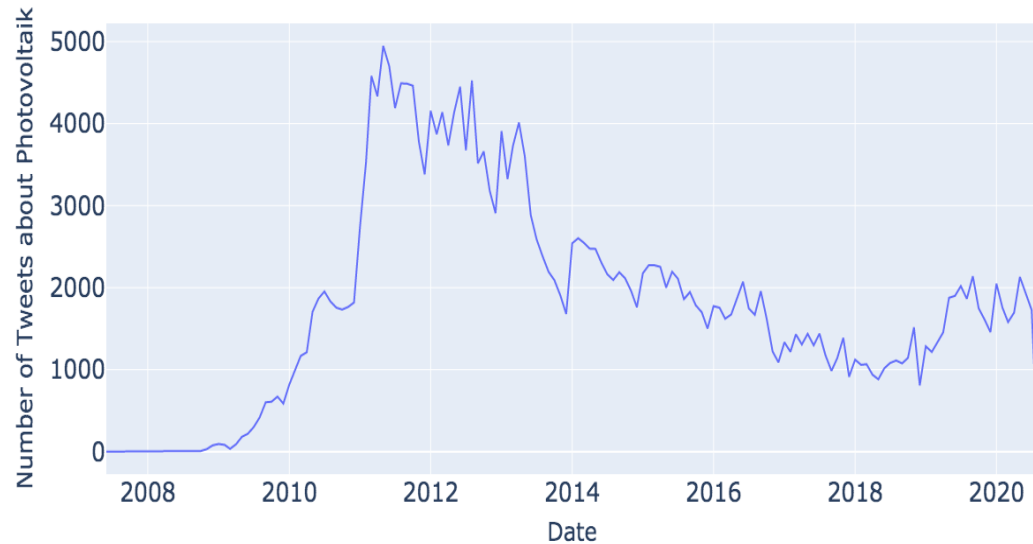


Twitter

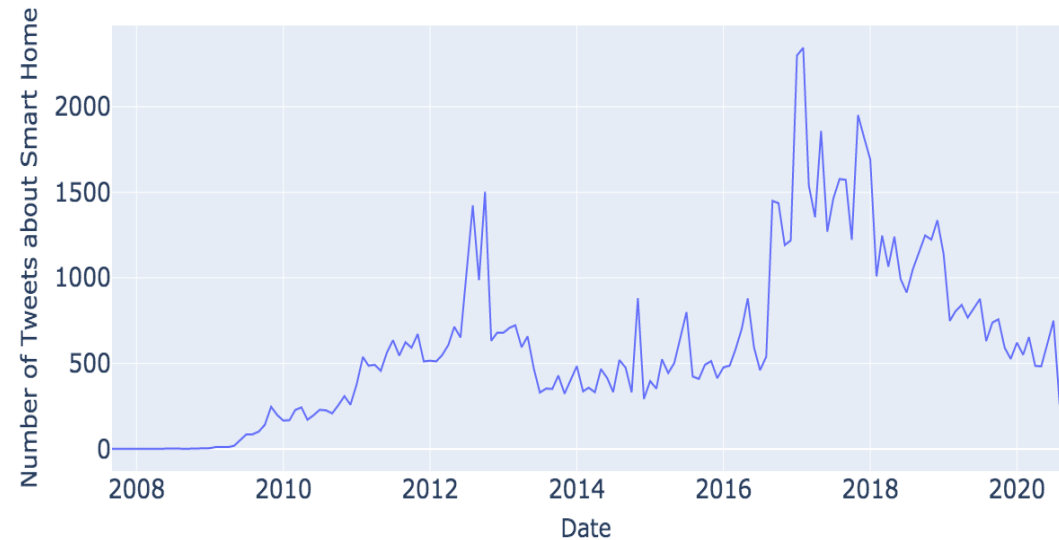


News

Causal Inference Analysis

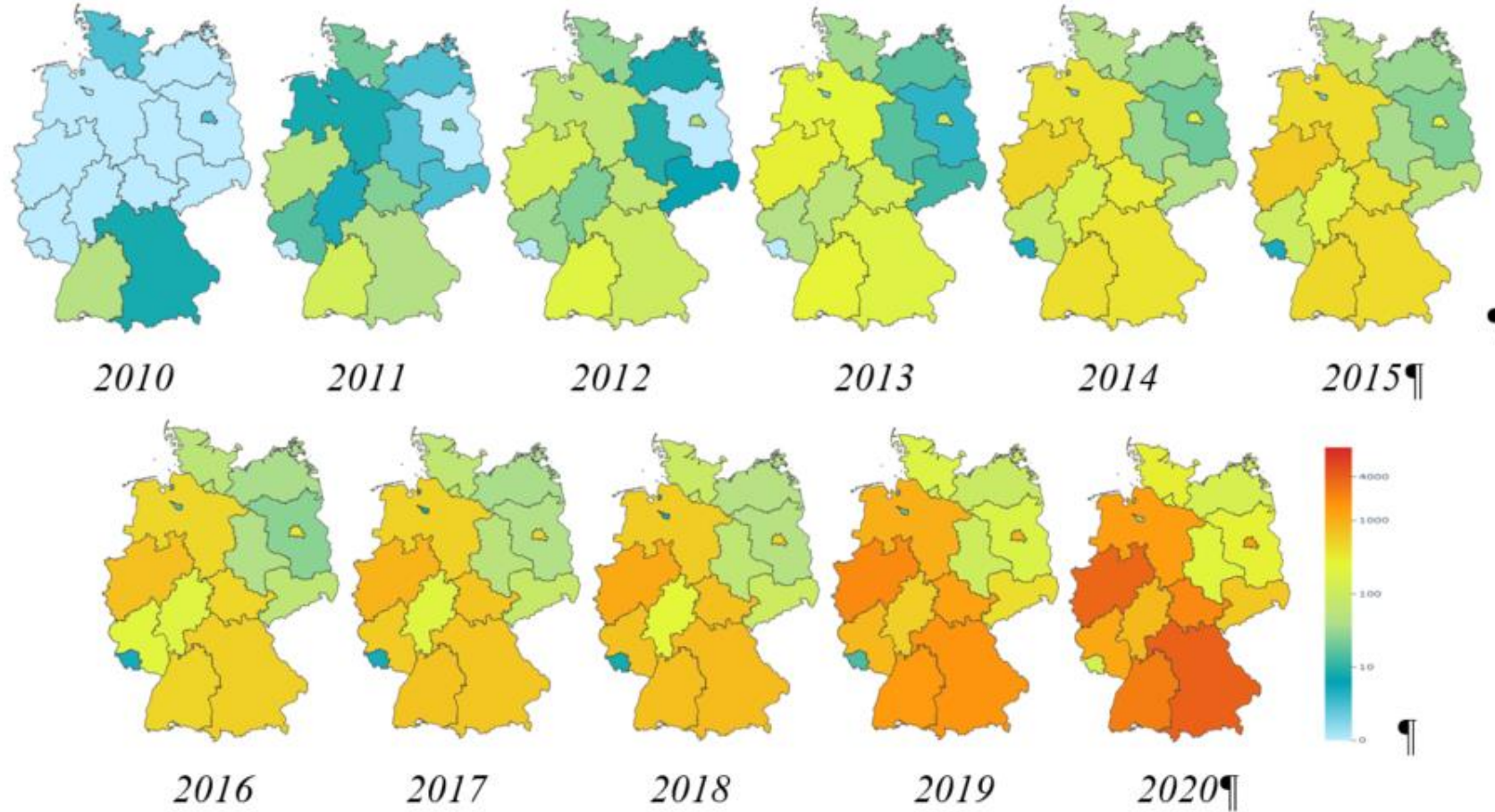


Number of Photovoltaic Tweets



Number of Smart Home Tweets

Geographical Diffusion Analysis



User Account Distribution

- 84579 Users
- Average: 8.25 Tweets; Median: 1 Tweet
 - 1 Tweet: 49577 users
 - 2 Tweets: 12569 users
 - Over 5 Tweets: 11257 users
 - Over 10 Tweets: 6376 users
 - Over 100 Tweets: 671 users
 - Over 1000 Tweets: 56 users
 - Over 10000 Tweets: 5 users

Username	Tweets	Categroy	Topic	Sub-Topic
WorkInSolarJobs	24894	Job advertisemnet	PV	PV-Techniken
NEUE_ENERGIE_VS	21336	Start-up	PV	Prosumer, PV-Techniken
Solarserver	18913	News	PV	PV-Techniken
photovoltaik	10823	News	PV	PV-Techniken, Prosumer
spotHunter	10565	News	PV	PV-Techniken, Prosumer
Solar_Reinigung	9885	Start-up	PV	PV-Techniken
solenergie	9731	News	PV	PV-Techniken
TeamHomeplaza	8752	Start-up	Smart home & Smart grid	Wohnkomfortsteuerung, Haustechniken
WorkInGreen_Job	8587	Job advertisemnet	PV	PV-Techniken
GermanPersonnel	7313	Job advertisemnet	Smart home & PV	Haustechniken, PV-Techniken

Follower Distribution

Username	Type	Followers	Tweets	ReTweets	Favorite	Avg. ReTweets	Avg. Favorite
mashable	News	9710000	1	29	46	29	46
tagesschau	News	2751000	20	547	480	27,35	24
derspiegel	News	2664000	16	339	399	21,1875	24,9375
zeitonline	News	2239000	25	308	430	12,32	17,2
BILD	News	1745000	6	7	15	1,166666667	2,5

Username	Type	Followers	ReTweets	Favorite	Content
FSHornschild	Private	3809	2335	3465	PV statistics with graphic
labymod	Start-up	31000	1101	943	Smart home solution with video
Schisslaweng	Private	7123	1060	2587	Smart home solution in very early time
ahoi_polloi	Private	9244	843	1914	Interesting smart home solution
FFriesecke	Private (Shareholder of start-up)	2984	739	2570	PV news with links

Recommendations on User Engagement for Smart Buildings in Germany

- Focus more on prosumer business models
- Speed up the provision of digital infrastructure
- Supporting start-up and new digital business-models
- Provide accessible, fact-based information on social media

Conclusion

■ Data perspective

- Twitter is an informative data source to track trends and concept diffusion in the public
- News are tightly related to policies or crucial commercial strategies and concepts

■ Methodology perspective

- Iterative web scraping approach based on keyword extraction
- Three new types of visualizations (small multiples of choropleth maps, network visualizations and sunburst charts) for effectively and clearly displaying a complex concept and its diffusion
- Topic decomposition helps to explain the causes of the temporal diffusion of a complex concept
- A user profile analysis can accurately unveil the degree of user engagement without the bias introduced by commercial actors

■ Content perspective

Thanks for your questions!

Contact Information

Jiao Jiao

Data Scientist

Competence Center Energy Policy und Energy Market

Fraunhofer Institute for System and Innovation Research ISI

Breslauer Straße 48 | 76139 Karlsruhe

Telefon +49 721 6809-545

<mailto:jiao.jiao@isi.fraunhofer.de>