

Detection of Emerging Food Trends

-Based on Facebook posts text data

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Preview

Since popularity of certain food is positively correlated with term mentioned on social media, I first plot raw frequency to detect general trends. But there is many noise by using word counts, thus co-occurrence matrix of ingredients is then conducted to precisely capture the trend. Finally I calculate PPMI to test whether the ingredient words co-occur by chance.

Data Preprocess

Remove url, punctuations, numbers, whitespaces and stopwords (most commonly used words in English i.e. 'I', 'are', 'and') in Facebook data.

Trend Detection

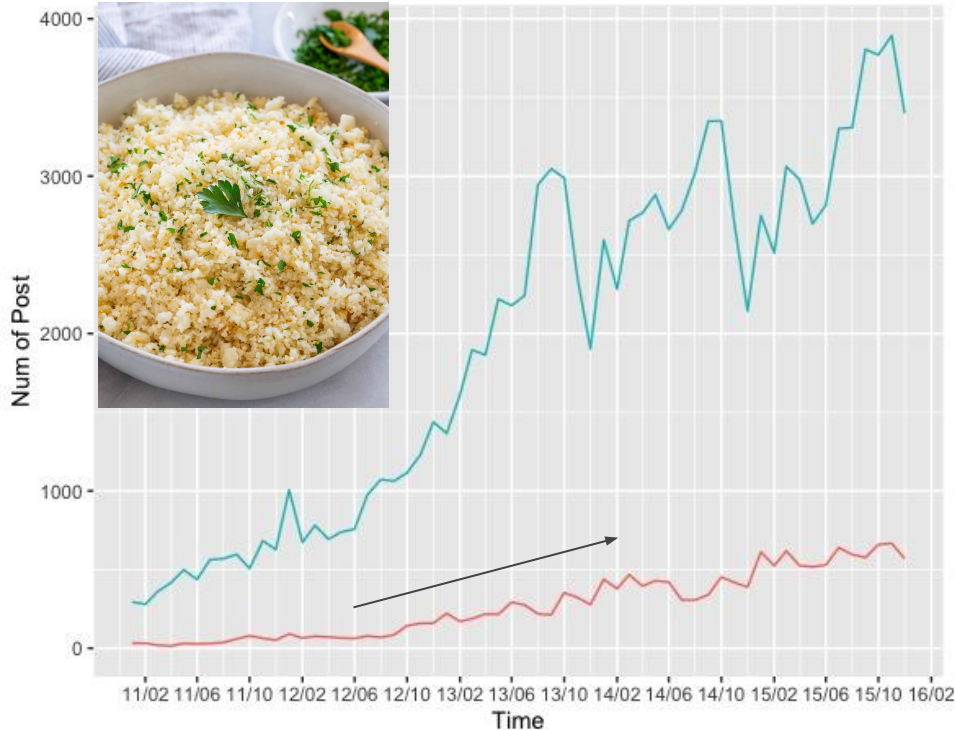
Examined the term frequency and co-occurrence of key ingredients to detect food trend. Calculate the PPMI to identify the association between words, whether they're informative about the target food.

Validation

Use 'Cauliflower Rice' and 'Avocado Toast' as the ground truth to test the effectiveness of this approach.

General Trend of Cauliflower and Rice

Cauliflower Rice Trend

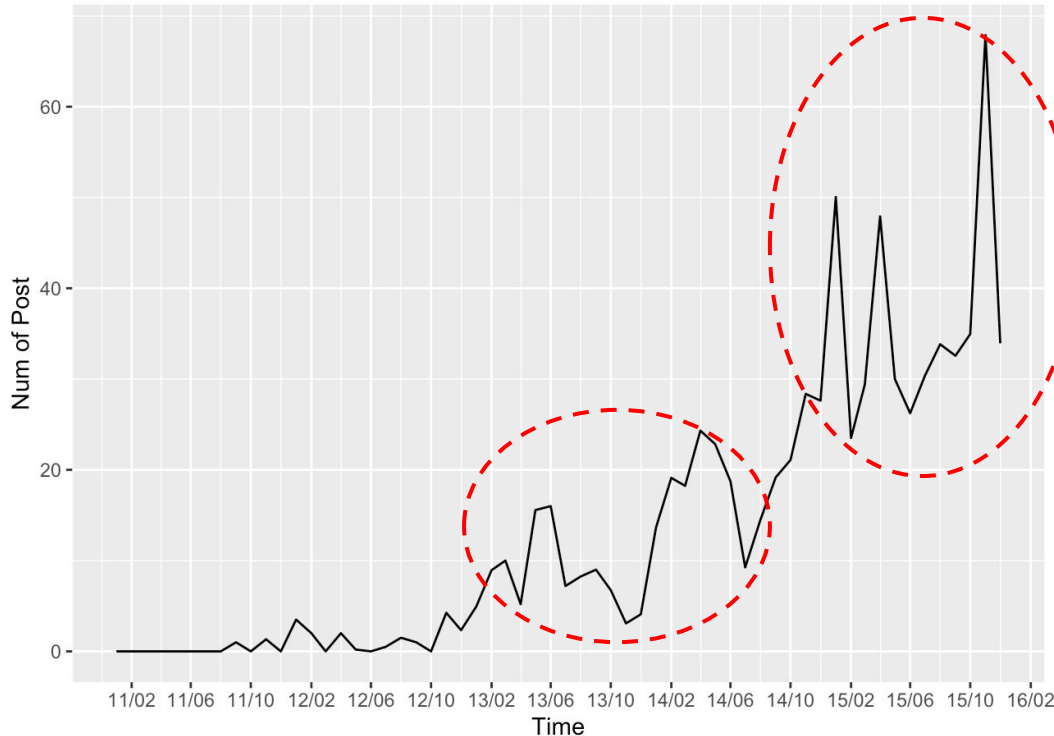


"Rice" is much frequently mentioned on Facebook, the trend of which cannot represent 'Cauliflower rice'.

'Cauliflower' can better capture the popularity of this new food combination, and we can see rising trend from the line chart.

'Cauliflower Rice' became a trending topic

Cauliflower Rice Trend

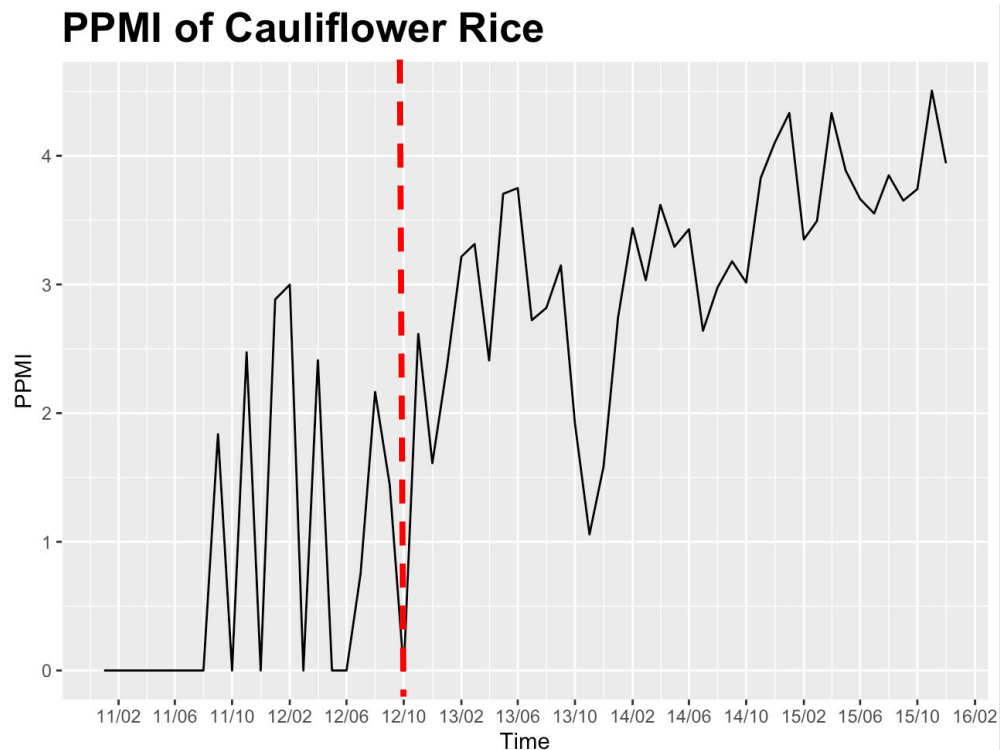


Based on word co-occurrence calculation, '**Cauliflower rice**' first became popular around **mid 2013**; Since **2015**, the number of posts about the food has grown exponentially.

This complies with the fact that sales of cauliflower spiked in 2016, a big jump from \$239 million in 2012 to \$390 million in 2016.*

* <http://time.com/4845148/cauliflower-rice-menu/>

Cauliflower and Rice Co-occur by Chance?

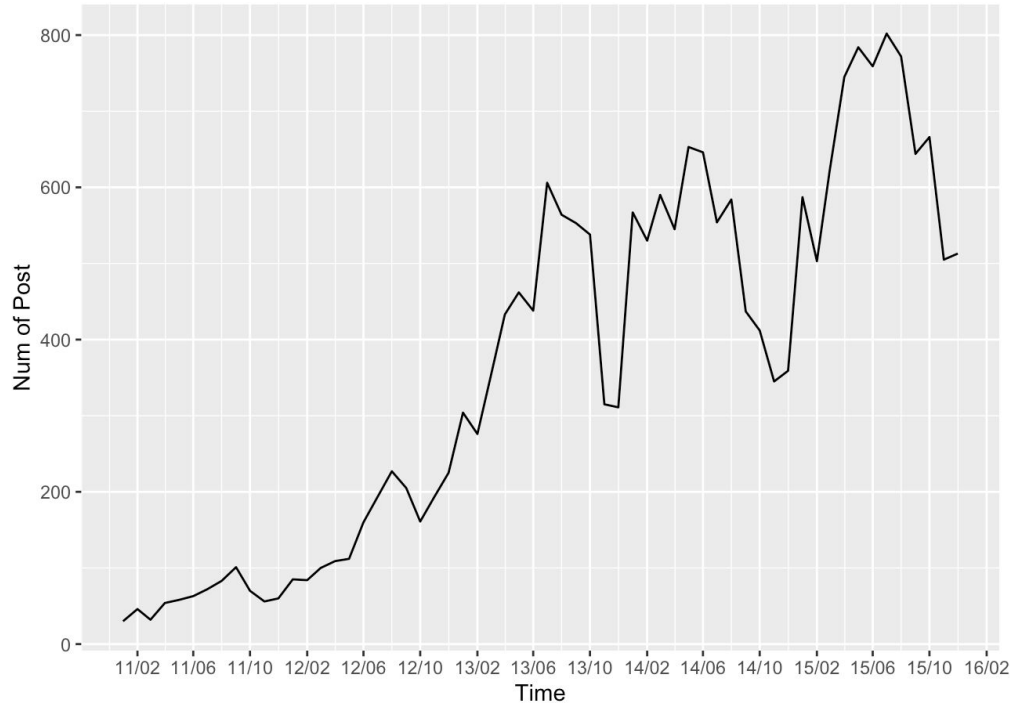


Since **late 2012**, the PPMI of 'Cauliflower rice' has become positive, indicating 'cauliflower' and 'rice' have less probability that they co-occurred in a post by chance.

Takeaway: Using the model, we can extract the signal as early as **mid 2013**.

Avocado Buzz

Avocado Trend

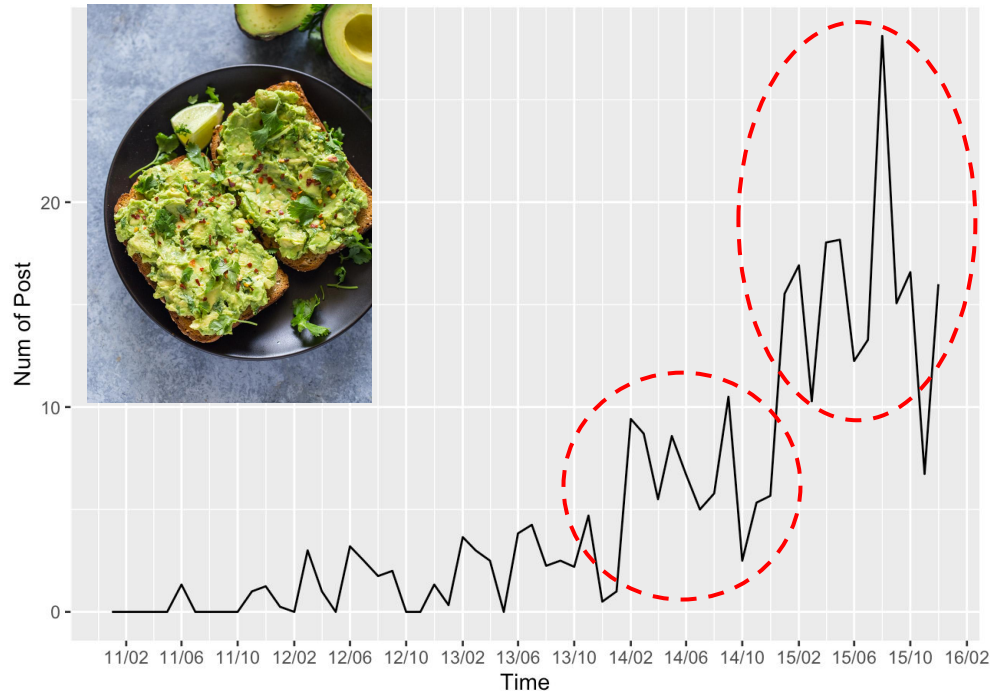


Avocado have seen a meteoric rise in popularity from 2011 to 2016. In 2014, Americans consumed 4.25 billion avocados.



Avocado Toast

Avocado Toast Co-occurrence



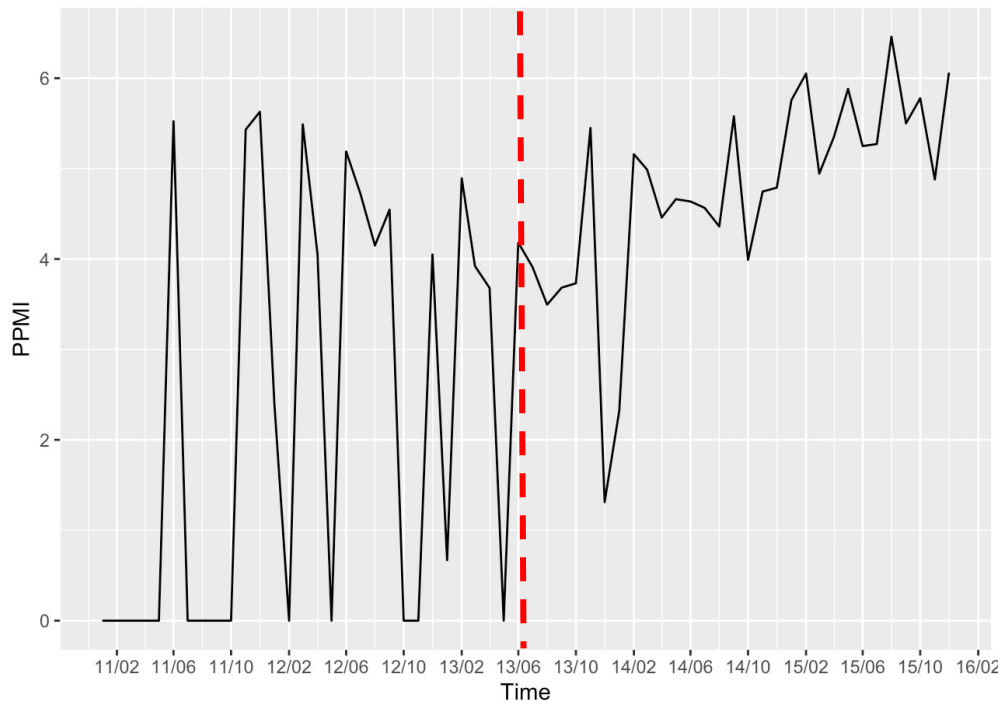
Avocado Toast became a food trend of the 2010s. The number of posts mentioning 'avocado toast' has seen a jump in **2014** and skyrocketed in **2015**.

This complies with the fact that Americans are spending nearly \$365,000 worth avocado toast per month in 2016, increasing from \$17,000 per month in 2014.*

*<https://time.com/4861608/avocado-toast-cost-spending-americans-square/>

Avocado and Toast Co-occur by Chance?

PPMI of Avocado Toast



The PPMI of 'Avocado' and 'Toast' has been positive since **mid 2013**, which shows 'Avocado' and 'toast' occur mutually more than individually.

Takeaway: Using the model, we can extract the signal as early as **2014**.

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