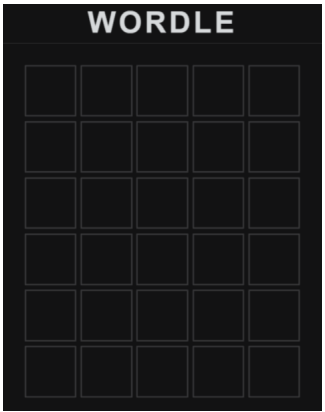
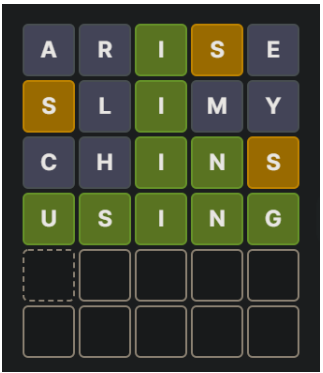
Capstone ideas.

David Tersegno
DSIR 222

April 18, 2022

A Wordle meta-game





Make a card game out of Wordle games shared on Twitter and Slack. Train models to make good decisions.

Cardle

- Scrape Slack and Twitter for cards.
- Card are collected in a deck.
- The deck is then drawn from for a game.

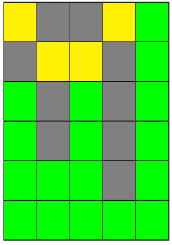
Cardle

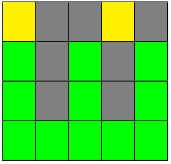

David Tersegno 12:33 AM
Wordle 300 6/6

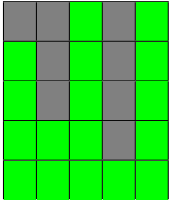

adumbuddy 1:02 AM
Wordle 300 4/6

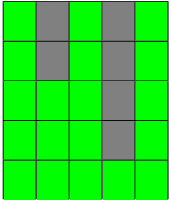

Liz Baessler 8:38 AM
Wordle 300 5/6


Jess Lanman 12:17 PM
Wordle 300 6/6

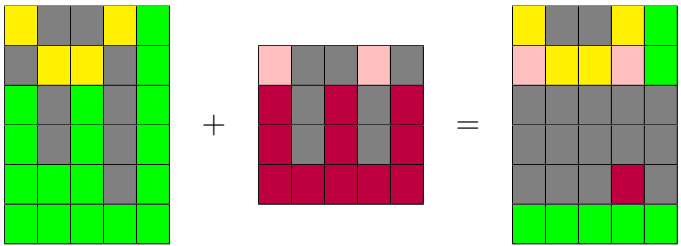








Cardle



- Cards are overlaid to claim spaces on a 5×6 grid.
- smaller cards have mores choices for where to place
- The board is populated with a player's colors, which add towards a final point value.

Cardle

pros

- create different NNs to act as players. Perhaps one that can beat a human.
- classify players by type (unsupervised)
- quantitatively compare decks and strategies
- Make as much of my own data as I need by running and saving games on PC
- cards are already divided into players
- Slack and Twitter have reliable APIs to search for wordle grids
- cards and games statistics are easy to encode as arrays of integers.
- save many models as different players
- sounds like a lot of fun. I'm doing this eventually

cons

- multiple NNs need to be run and trained on a very large data set before they start making good decisions
- Implementing the game itself and a way for the models to interact with it will take some work.
- Entirely abstract. Doesn't show off NLP, regression unit interpretation

Longshot: Inscryption analytics

- Analyze a deckbuilding video/card game with beta data on thousands of players
- Game is entirely discrete — cards are placed in one of four positions, have easily enumerable, integer qualities.
- Quantitatively compare decks and strategies by success
- Build a model that can make informed decisions.

Longshot: Inscryption analytics

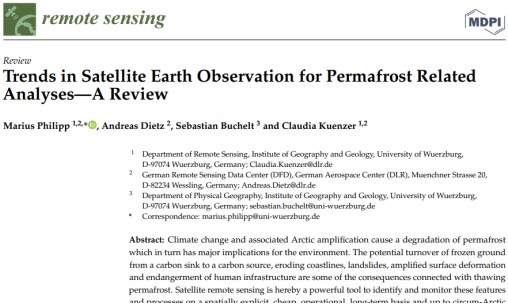
pros

- Use NNs, decision trees, or other to make player decisions
- identify pre-determined card types (wolf, insect, hooved, bird) as supervised learning
- identify player types as unsupervised
- Game is already divided into discrete steps and cards
- Data is already "useful" as it influenced the development
- sounds like a lot of fun
- active community

cons

- Waiting to hear back from the developer and publisher. Good chance I wont hear from them.
- regression methods limited
- I could be in over my head with game analysis

Climate science literature review and meta-analysis



remote sensing

MDPI

Review

Trends in Satellite Earth Observation for Permafrost Related Analyses—A Review

Marius Philipp [1,2,*], Andreas Dietz [2], Sebastian Buchelt [3] and Claudia Kuenzer [1,2]

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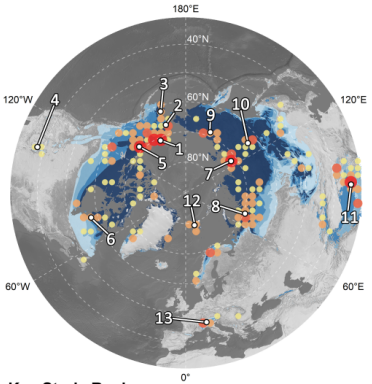
Abstract: Climate change and associated Arctic amplification cause a degradation of permafrost which in turn has major implications for the environment. The potential turnover of frozen ground from a carbon sink to a carbon source, eroding coastlines, landslides, amplified surface deformation and endangerment of human infrastructure are some of the consequences connected with thawing permafrost. Satellite remote sensing is hereby a powerful tool to identify and monitor these features

- Literature review scraped for >500 permafrost papers on remote sensing data since 2000
- Statistics on nationality and scientific impact (citations)
- correlations with local permafrost level

The goal: generate numbers (regression coefficients) that reflect how effectively different groups of people will perform research and on which topics.



Permafrost
- Continuous
- Discontinuous
- Sporadic
- Isolated

Number of Studies
- 1
- 2-5
- 6-10
- >10

Key Study Regions

1. North Slope Borough
2. Seward Peninsula
3. Yukon–Kuskokwim Delta
4. Rocky Mountains
5. Mackenzie Delta
6. Umiujaq
7. Lena River Delta
8. Yamal and Gydan Peninsulas
9. Kolyma Lowland
10. Central Yakutia Lowland
11. Beiluhe region
12. Svalbard
13. European Alps

– Study could be duplicated for another topic:

- deforestation
- coral reef bleaching
- extreme weather
- desert expansion
- industrial pollution

Climate science literature review and meta-analysis

pros

- Shows off web scraping
- Uses regression
- could apply unsupervised classification to match "science types"
- The project is its own literature review.
- previous work in remote sensing

cons

- probably not "big data" — a statistically small number of scientifically active countries generating statistically small numbers of papers
- predictive and classification power may be limited
- will probably run into paywall problems.