

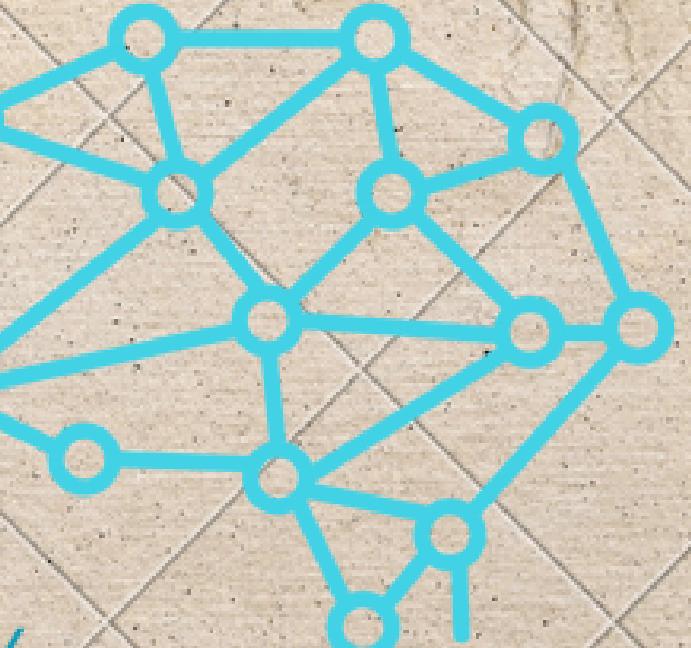
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LitGraph

UNDERSTAND INTELLIGENTLY

Visualizing Literature With NLP

Group 7



lager seemed compact and close together in the one small village. It faced the mainland and offered pragmatic people. In the years that followed in *naomhóga* to strip their beams and slates, and anything else, to new lives.

way above, was the two-storey house. It had been modern at first, but had punctured the slate roof at the seventies it was bought by an Alabama called Taylor Collings, who had been on holiday and fell in love with the village as a home for exiled islanders and bought the

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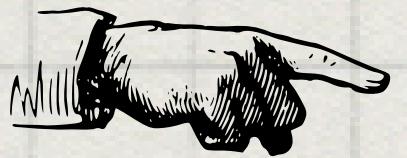
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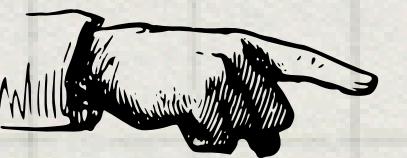
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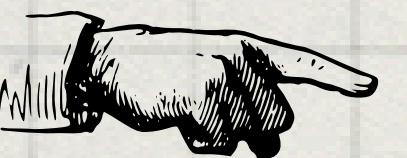
Icileán – which wanted to establish a national park. The issue was still before the Supreme Court as I crossed on that first boat of the season, and the future was unclear. There were signs of the island being brought back to life anyway, I had



Product proposal & Value proposition



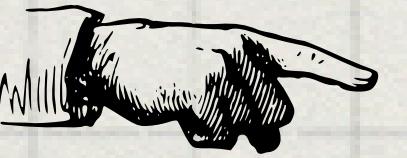
Industry Insights & Competitive Landscape



Example of Use Cases



Deep Dive



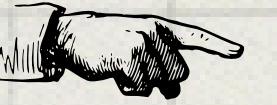
Model Development



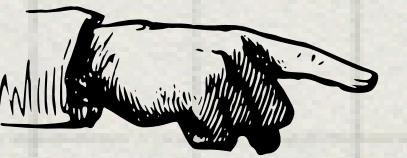
Trial and Error



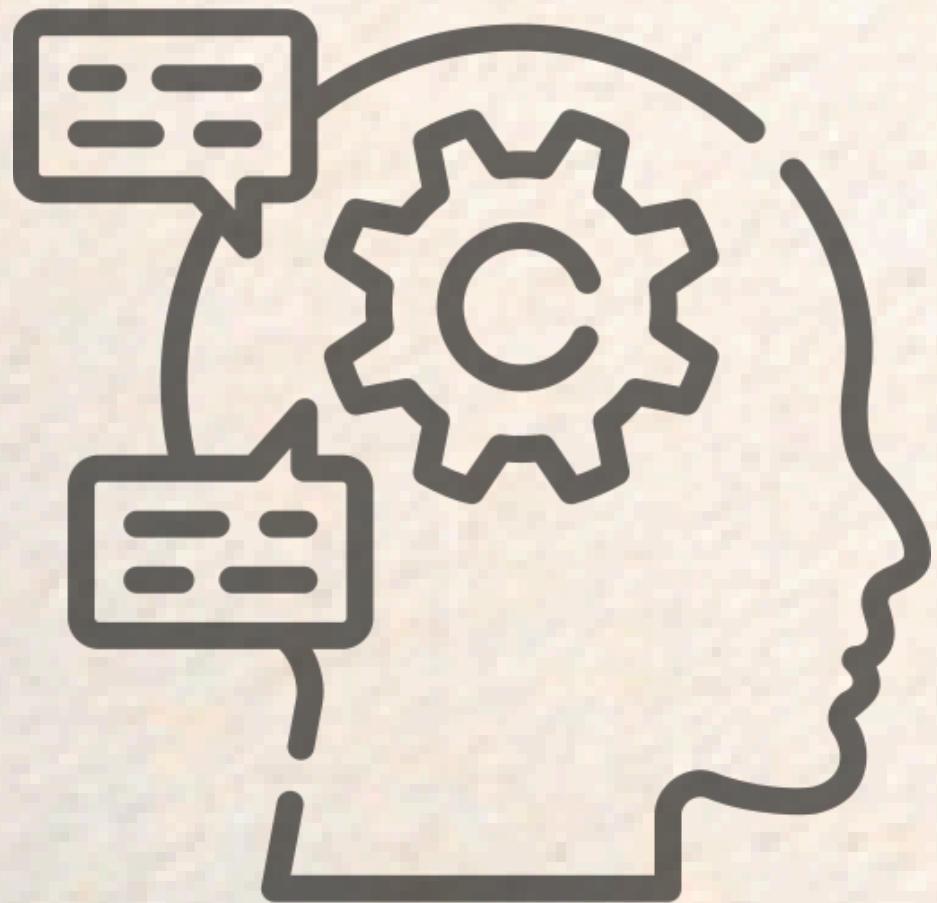
Deployed Solution



MVP



Further Development and Conclusion



Product Proposal & Value Proposition

Product Proposal

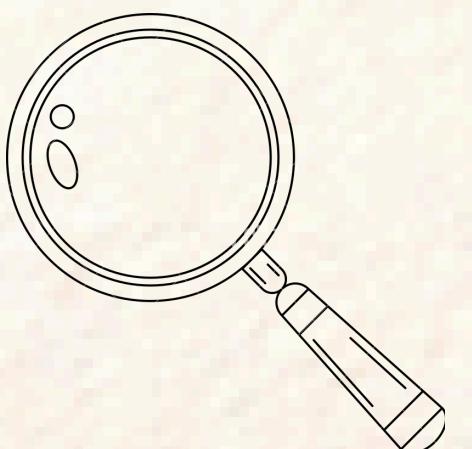
Application providing deeper insight
into **Old Norse** literature through the
combination of **NLP** models and
Network Graph Analytics.

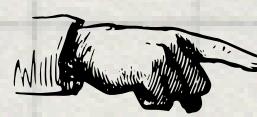


Value Proposition

- **Multi-disciplinary Educational Tool:** Engage with literature, history, social science. App's graphic summaries enable a deep understanding of the subject matter and to actively engage in the learning process
- **Preservation and Cultural Understanding:** Contributes to cross-cultural understanding by preserving the Icelandic and Old Norse language, literary traditions, and religious aspects. The app helps bridge the gap between cultures and ensures the preservation of Icelandic culture for future generations.

Industry Insights & Competitive Landscape





Industry Insights

Global Edtech market size 2022 → **74 Bn \$**

by 2030 → **288 Bn \$**

Key factors

Education Technology in Language Learning

Personalized Learning and Customization

Cross-Cultural Understanding and Language Preservation

Data-Driven Insights and Research Opportunities

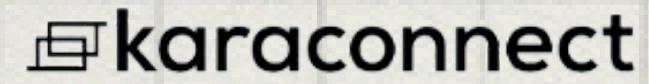


Competitive Landscape

EdTech Solutions



LEARNING IS JUST ONE TEXT AWAY



beedle

National Programs

Nordic eSchool

Potential Collaborations



Iceland Teachers
Association



Government of
Iceland

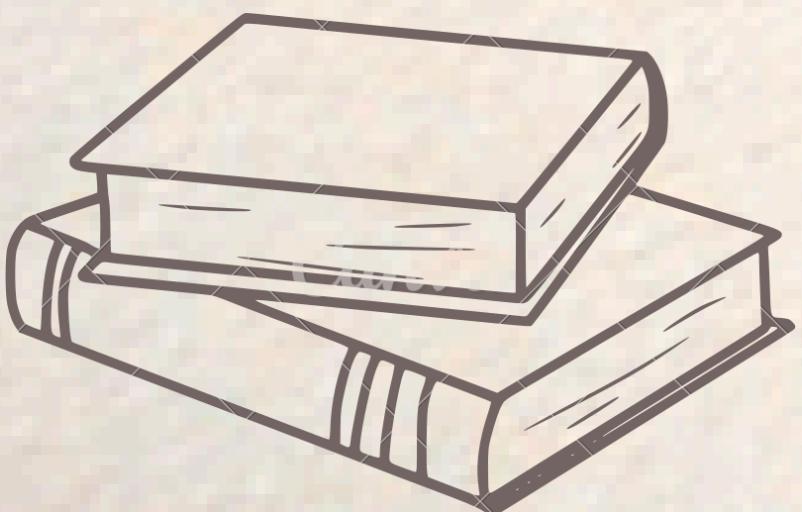


University of
Iceland

Smart Schools

Future Classroom Lab

Example of Use Cases



Conceptualised Use case:

- **Graph Analytics for literary works**
 - Character interplay
 - Relationships
 - Actions
 - Degrees of separation



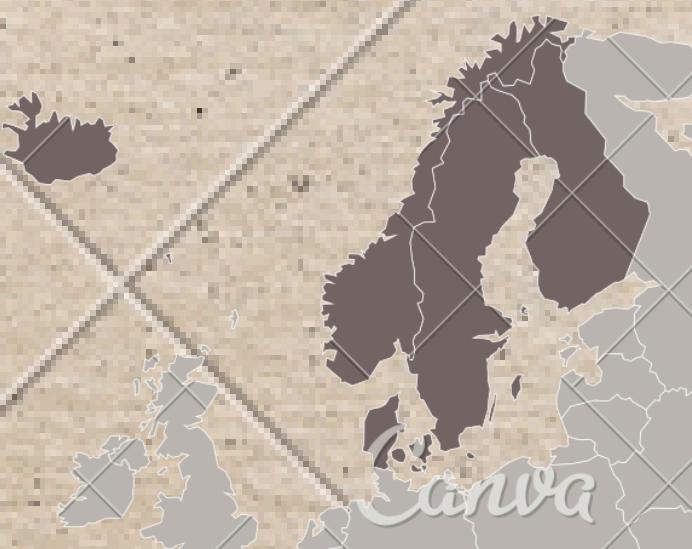
Alternative Use Cases:

- **Creative idea conceptions for media**
 - for authors, TV, Movies, Character development
- Cultural insight into Icelandic and old

Deep Dive

Old Norse & the Sagas

- Modern Icelandic ≈ Old Norse
- **Insight** into the **culture, beliefs** and **history** of the Norse people.
 - Old Norse literature is divided into four categories
 - Mythology - stories, folklore, Norse mythology
 - Heroic Sagas - "Volsungar Sága" "the Sagas of the Icelanders"
 - Skaldic Poetry - Collection of court poetry and kennings.
 - Eddic Poetry - Anonymous, Hávamál and Völuspá



Manuscript Chosen for MVP development

Brennu-Njáls Saga

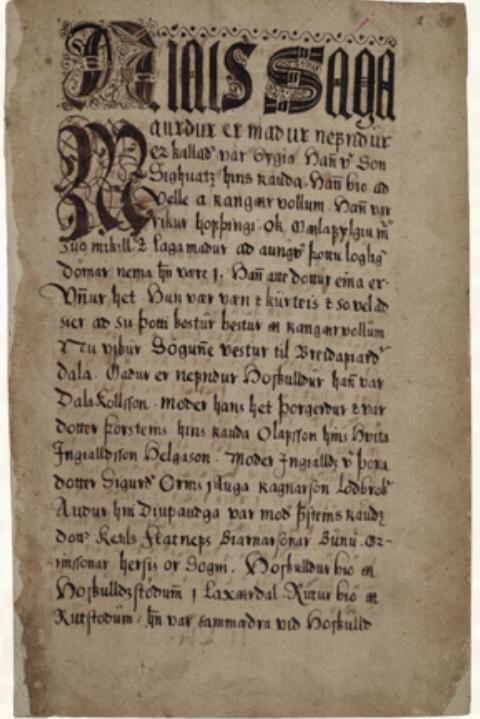
- One of the most renowned and celebrated sagas of Old Norse literature



Njáls Saga from 1300



Njáls Saga from 1400

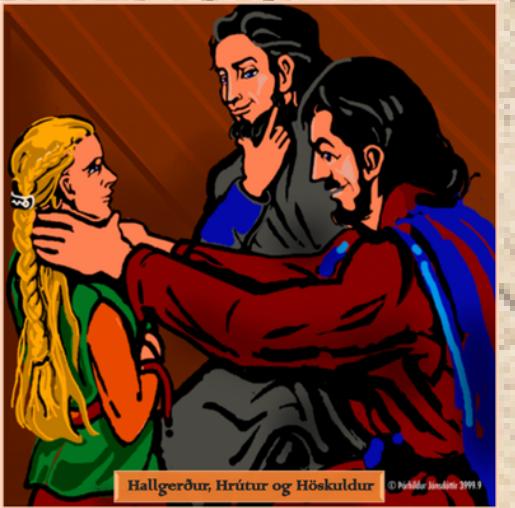


Njáls Saga from 1600

- The saga presents around **500** complex and memorable characters.
- It explores their personal conflicts, familial relationships, and the tragic fates.

Quick storyline - Brennu Njáls Saga

Main Characters



Hrútur Höskuldur



Gunnar Hallgerður



Njáll Bergþóra



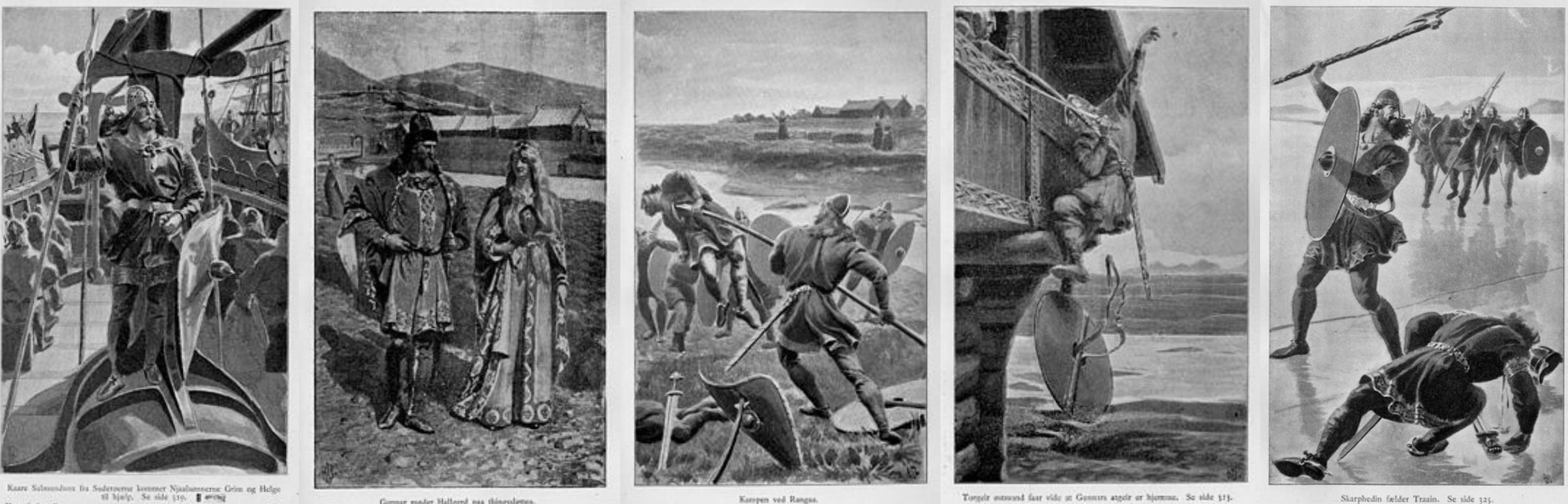
Skarphéðin Höskuldur



Kári

The Story of **BURNNT NJAL**

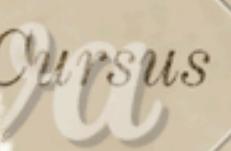
Illustration by Knud Larsen



Quick Storyline

Model Development

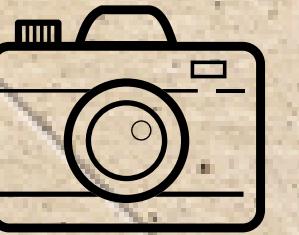
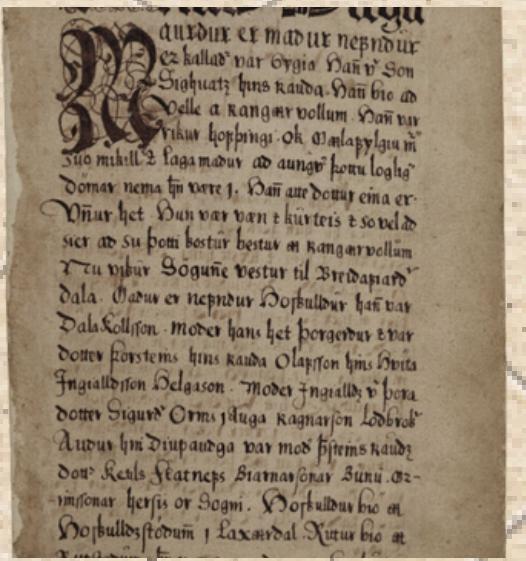
Trial and ΕΓΓΟΓ

euismod lacinia at quis risus sed vulputate odio. Sed euismod lacinia at quis. Ut tellus elementum
icies lacus sed turpis tincidunt id aliquet
assa ultricies mi quis. Magna fermentum
hus. Eget sit amet tellus cras
vitae et leo duis ut diam
aculis eu non diam phasel-
Cursus sit amet dictum


illamcorper sit amet
semper feugiat nibh
ing elit duis tris-
mauris nunc
la fames ac
h mauris.

At

Trial and Error



OCR

Illegible text and proper OCRs
not existing for Old Norse

t on holiday and fell in love with it.
n to rebuild the village as a holiday
ed islanders and bought their plots,
who could expect big money for a
ccessible island? One man sold for a
e rumour went. Collings was larger
west of Dingle loved a character, so
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Trial and Error



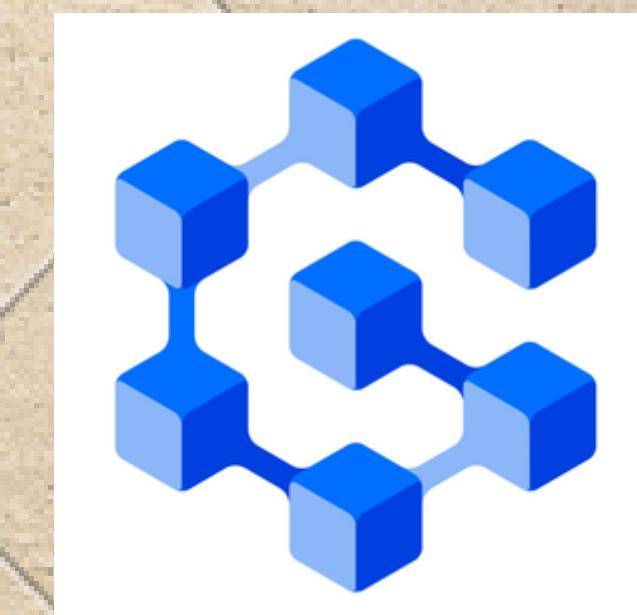
['GMÃ¶rÃ°ur', 'GgÃN', 'gja',
'GSighv', 'ats', 'GrauÃ°a']

utf-8 not displaying
icelandic characters in the
correct format

Most models being
incomplete for the
requirements of the project

Trained on

Dataset
Icelandic Gigaword Corpus v20.05 (IGC)
Icelandic Common Crawl Corpus (IC3)
Greynir News articles
Icelandic Sagas
Open Icelandic e-books (Rafbókavefurinn)
Data from the medical library of Landspítali
Student theses from Icelandic universities (Skemman)



Trial and Error



Ice-Bert

m3hrdadfi/icelandic-ner-roberta like 0

Token Classification PyTorch TensorFlow Transformers Icelandic roberta

Model card Files and versions Community 1

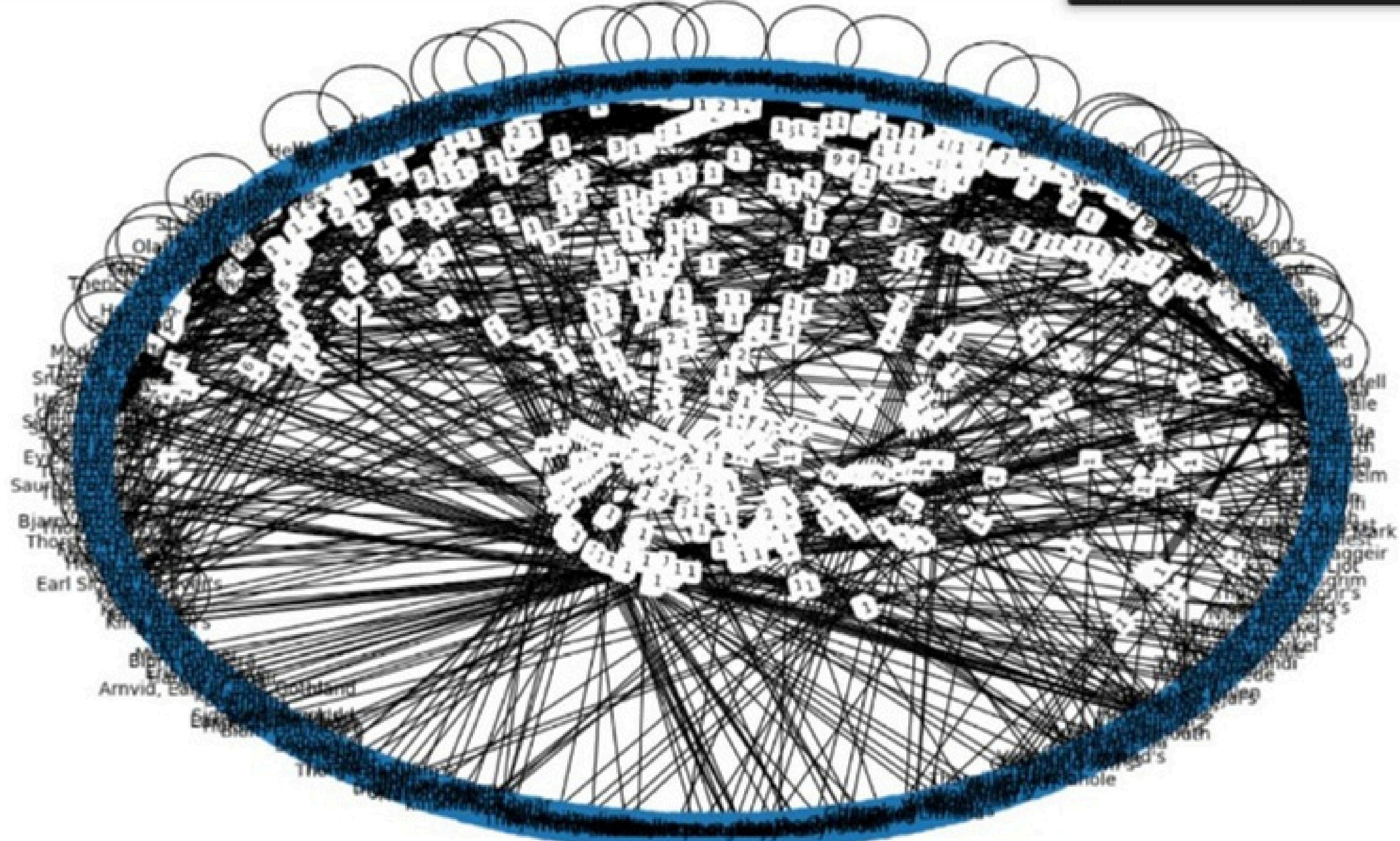
IcelandicNER RoBERTa

This model was fine-tuned on the MIM-GOLD-NER dataset for the Icelandic language. The [MIM-GOLD-NER](#) corpus was developed at [Reykjavik University](#) in 2018-2020 that covered eight types of entities:

Ice-RoBerta

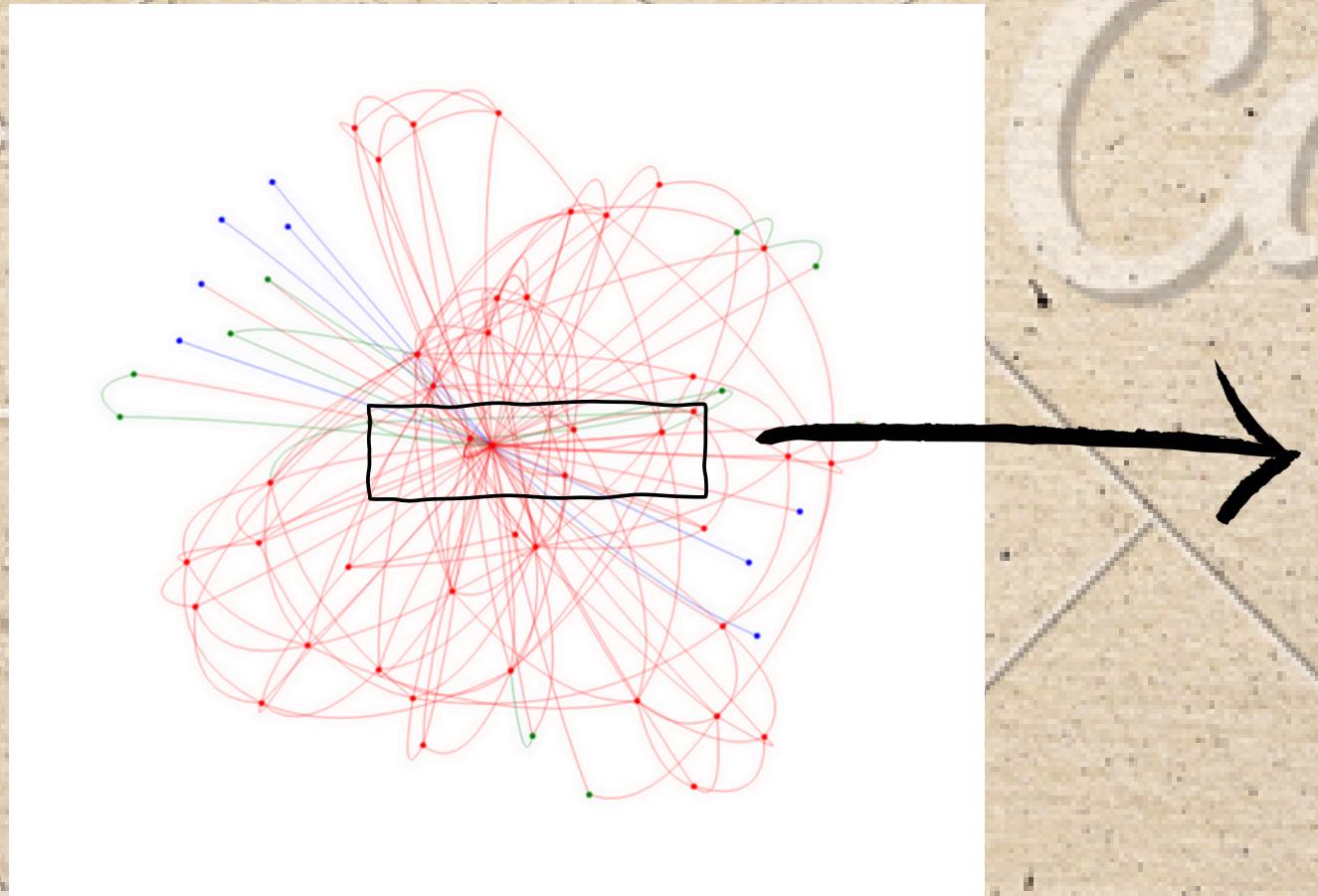
**Icelandic language models
are not developed enough
to tokenize relations**

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Trial and Error

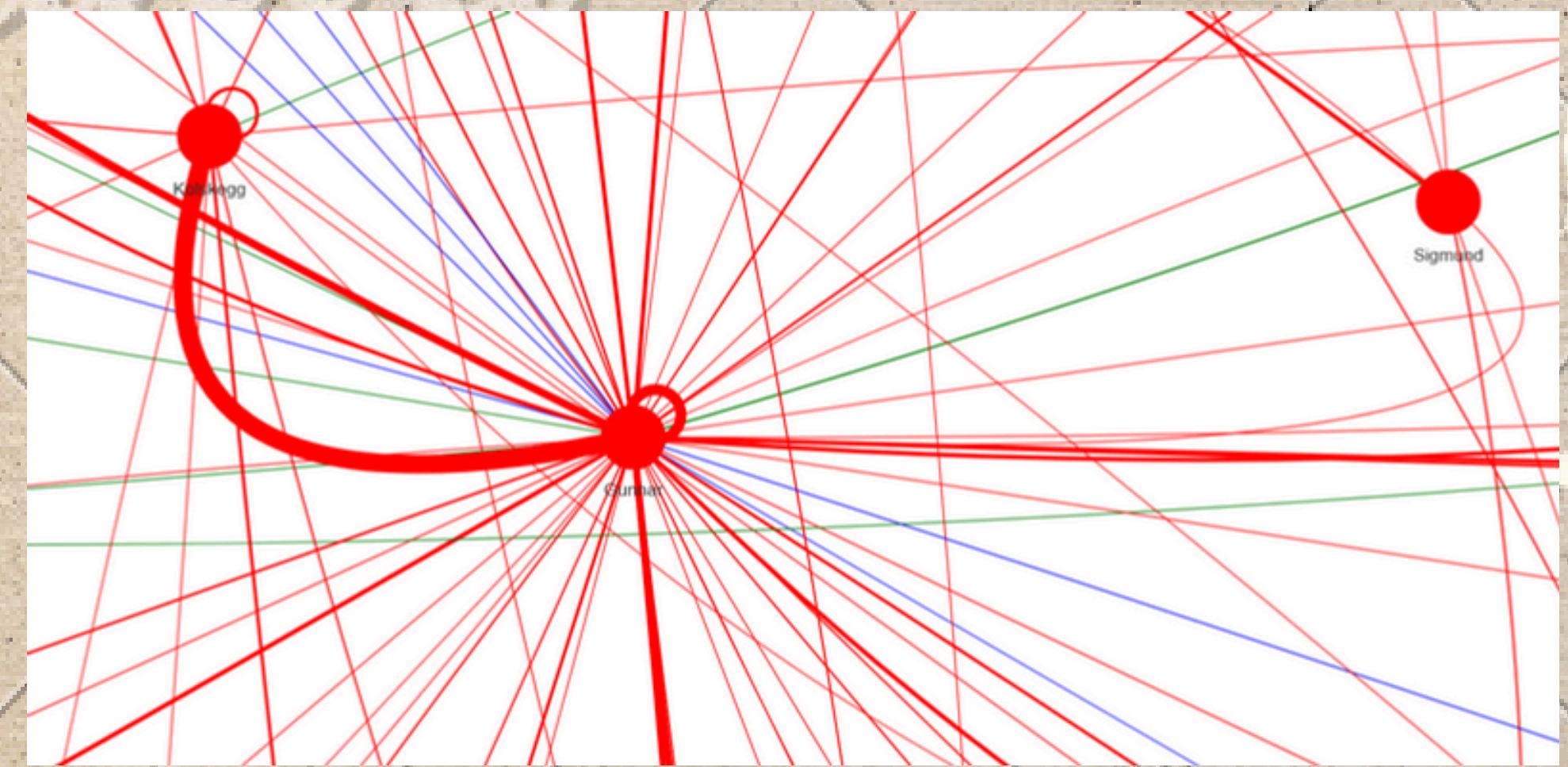
**Pyvis Library using
spaCy**



**Colors and thickness
representing the weight of the
relation**



**Unable to display
text on the edges**



nal park. The issue
ossed on that first
clear. There were
life anyway, I had

Deployed Solution

euismod lacinia at quis risus sed vulputate odio. Sed euismod lacinia at quis. Ut tellus elementum tricies lacus sed turpis tincidunt id aliquet massa ultricies mi quis. Magna fermentibus. Eget sit amet tellus cras vitae et leo duis ut diam aculis eu non diam phasellus. Cursus sit amet dictum

illaamcorper sit amet semper feugiat nibh ing elit duis tristis mauris nunc la fames ac nibh mauris.

At

Deployed solution

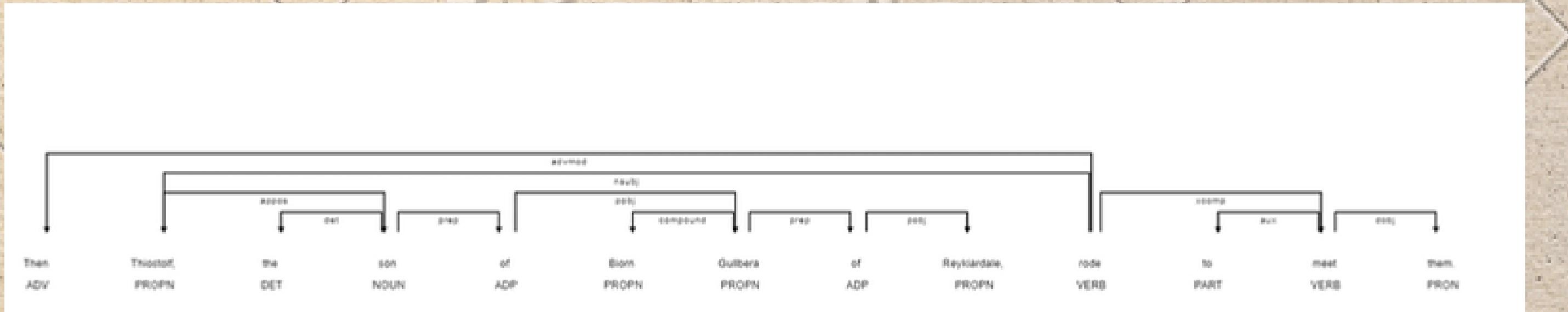
spaCy



Streamlit

Deployed solution

spacy



MVP

euismod lacinia at quis risus sed vulputate odio. Sed euismod lacinia at quis. Ut tellus elementum
icies lacus sed turpis tincidunt id aliquet
assa ultricies mi quis. Magna fermentum
hus. Eget sit amet tellus cras
vitae et leo duis ut diam
aculis eu non diam phasel-
Cursus sit amet dictum
at

illamcorper sit amet
semper feugiat nibh
ing elit duis tris-
mauris nunc
la fames ac
h mauris.

At

Cannabis

I rejected most proposals. As an officer, I understood the nature of honeypot data."

Trook accepted the resignation of Kostyuk, saying he could no longer work because of anti-corruption efforts were being "falsely depicted."

Ponashenko approved his resignation in April and Trook retired from the security service in July.

Strong surveillance

Trook was recruited to the job by his Soviet Supply Office, or employees, as well as Kostyuk and Ponashenko.

Trook worked with Kostyuk and Ponashenko to play a role in preventing his resignation.

"They were asked, as my deputy [Denshchikov] himself, 'Is it really OK they don't want you to leave? I can't bear to see them leave the country,'

"Trook said he had to tell his superiors about the surveillance, as well as the fact that he was not responsible for anti-smuggling efforts.

He added that the Ministry was continuing to monitor him.

A former source said Denshchikov

had agreed to give power to the security services, and to running it instead of its usual chief, a government minister of state importance, but "it's a different function," according to the Security Service of Ukraine.

"There's also no greater guarantee of a reliable," he said. "The security service has been created and we've seen that [open] a genuine fight against corruption would begin now with the resignation of Denshchikov."

After Trook accepted his resignation, Ponashenko appointed his successor as April and Trook retired from the security service in July.

Greg cannibals

Trook was replaced in August by his former Supply Office director, as well as Kostyuk and Ponashenko.

Trook and Ponashenko had a role in arranging his resignation.

"They were telling me, 'We first need to make sure that Ponashenko is not responsible for anti-corruption efforts. We need to capture him, so we have to tell him about his attempts to interfere in areas for which he was not responsible, including anti-smuggling efforts. Fight them that I wouldn't allow that,'" Trook added that the Security Service institution of "muzhnyashchik" is Russian term for someone whose sexual complaints were made against another person, before he was a homosexual. He hoped a genuine fight against corruption would begin at the start of the resignation of Denshchikov.

Joint projects

After his resignation, Trook used his anti-corruption fight by submitting to the Federal Corruption Bureau documents and proof of Ponashenko's involvement in Denshchikov's illegal actions.

Denshchikov was also given Kostyuk and Shapoval by anti-corruption investigators to follow them, according to Kostyuk.

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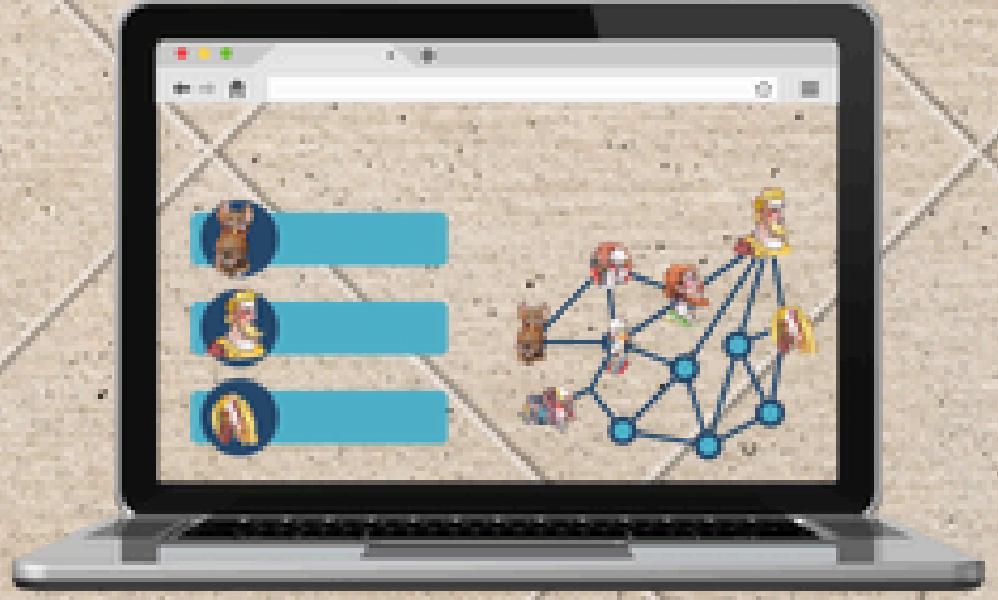
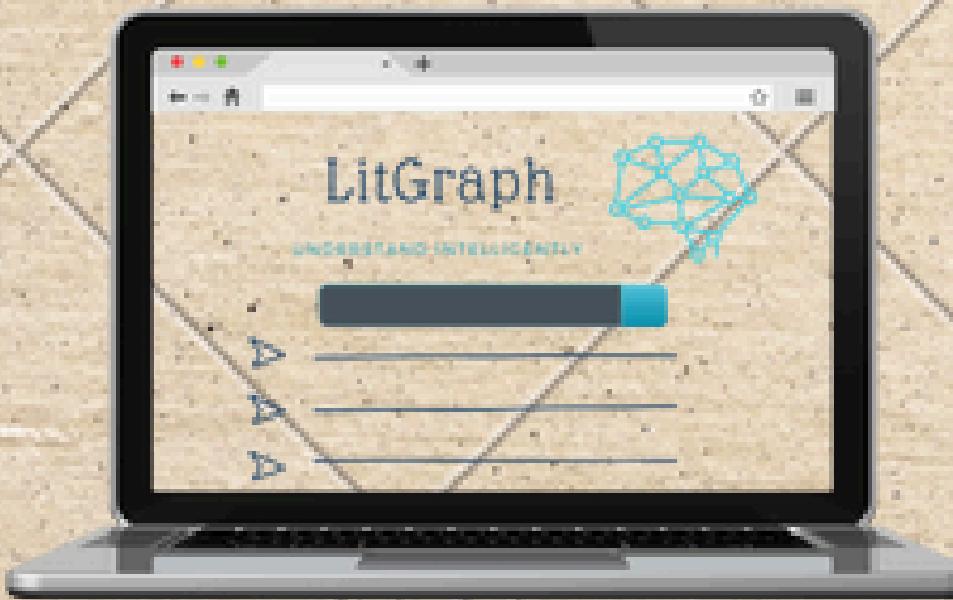
Joint projects

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MVP Mock up

- Landing Page
- Search
- Output

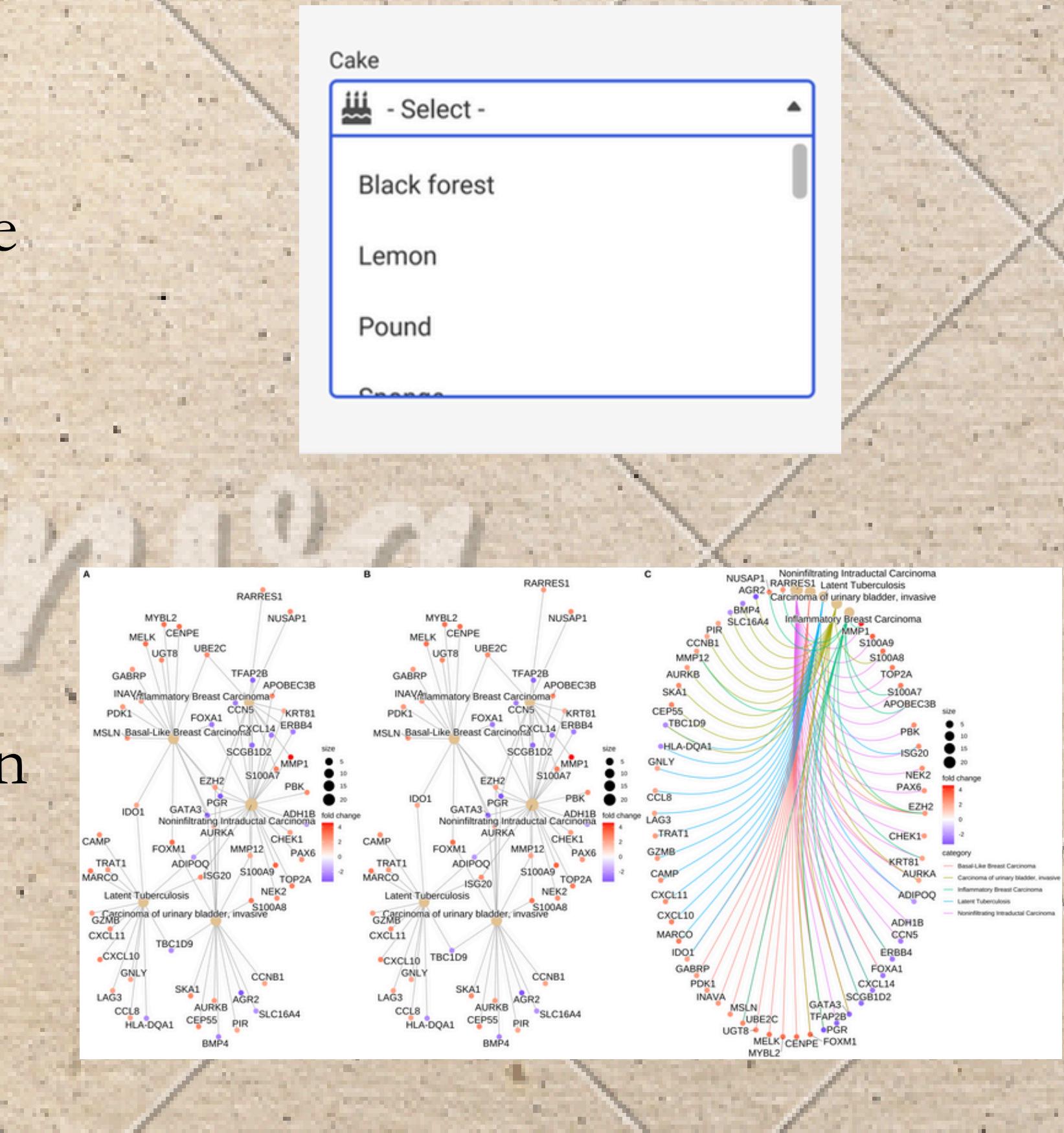


Further Development and Conclusion

Further Development - Improvements

Product Features

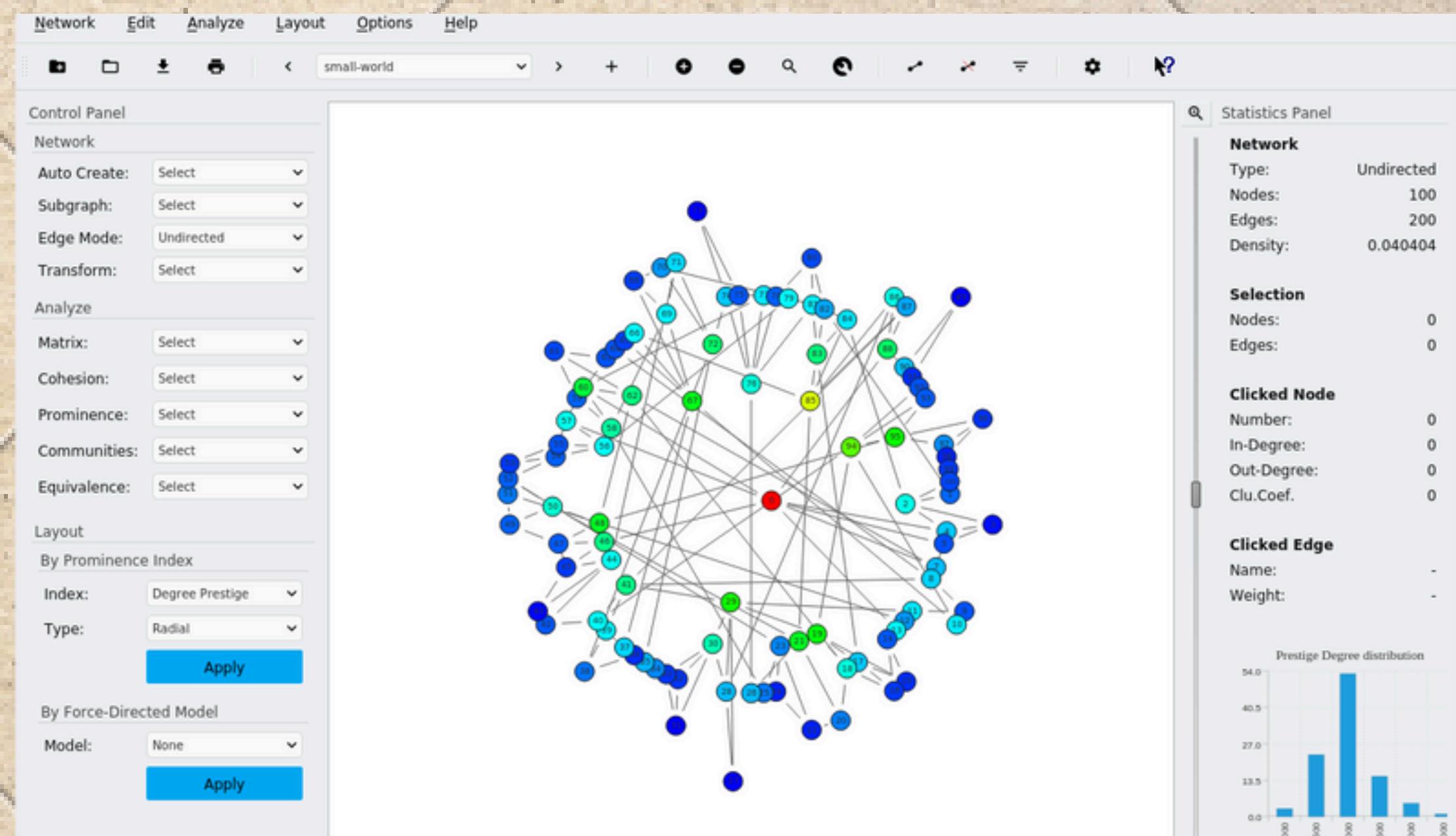
- Book Selector: Expanding our database
- Enriching our graph by adding more complex / accurate interactions between characters. Relations between different books, chart customization



Further Development - Improvements

Product Features

- Move from streamlit to our own hosted web

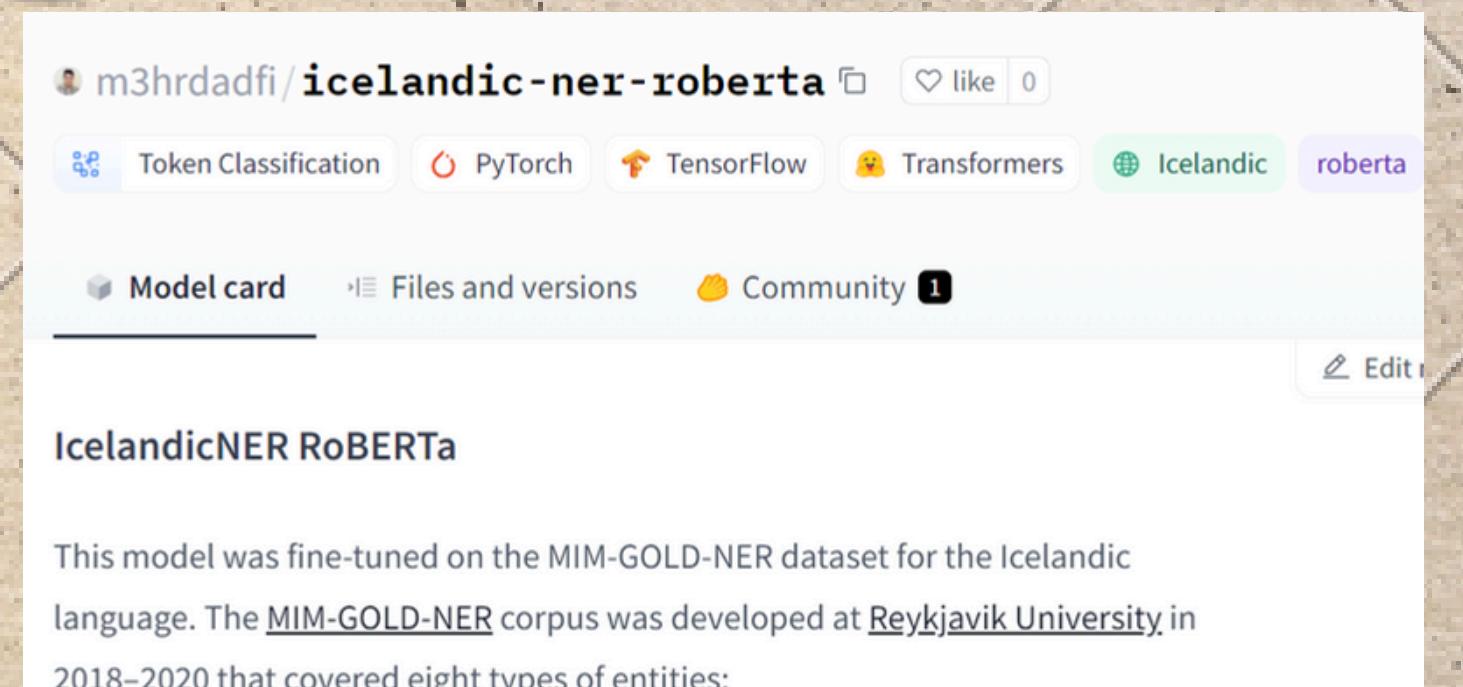


Further Development - Improvements

Model Improvement

Make our platform work using an Icelandic NER model:

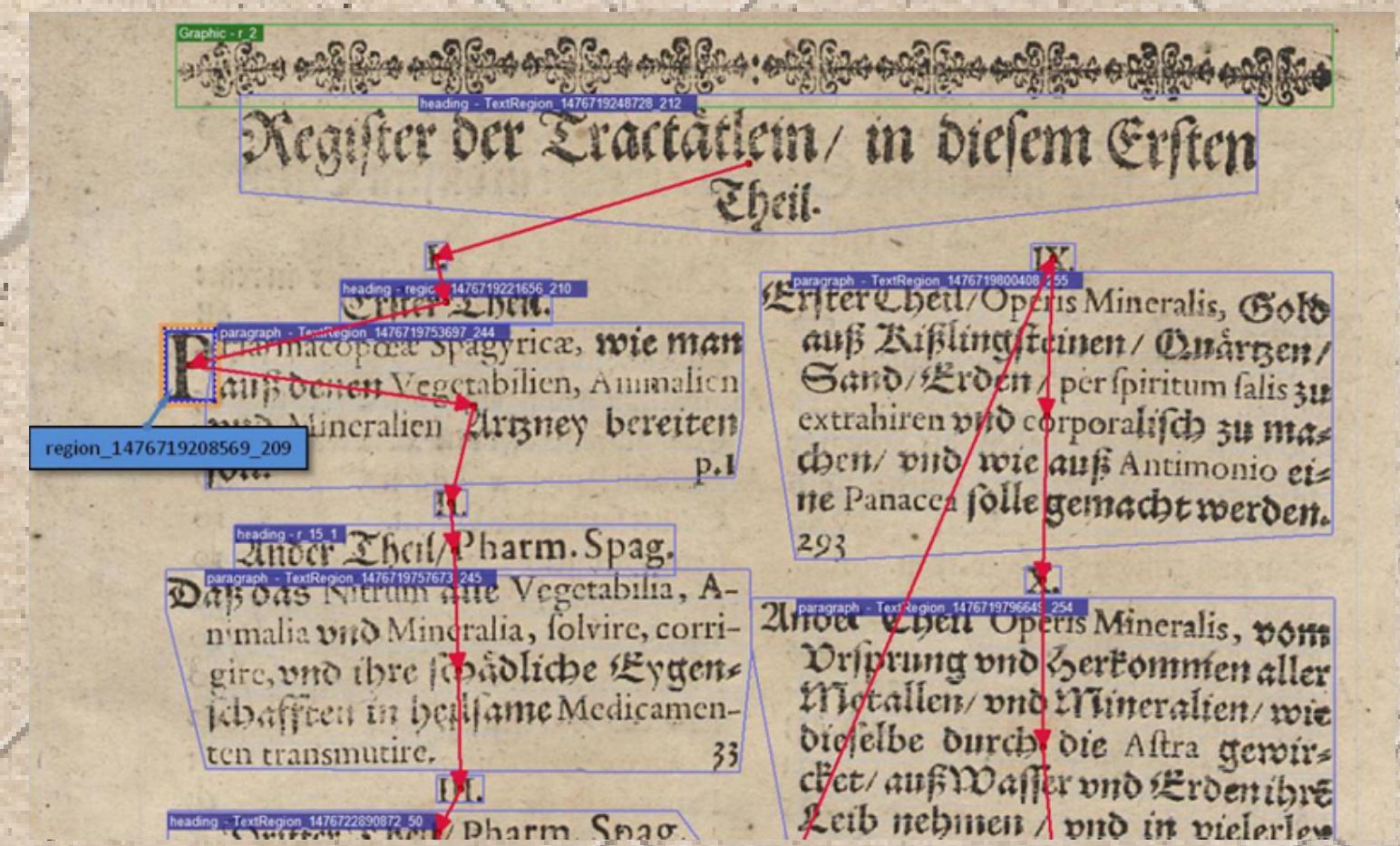
- Option 1: Making our app work with `icelandic-ner-roberta`.
- Option 2: Wait until Spacy release their Icelandic language pack (On their roadmap).
- Option 3: Train our own Icelandic / Old Norse NER Model, with tokenizer for actions and relationships.



Further Development - Improvements

Beyond the model

- Development of an OCR model
- Availability of applying our model to old texts that have not been digitalized before / better digitalization
- Access to physical book copies thanks to our collaboration agreement with Government and Universities



Further Development - MLOps

275



ML model - NLP



Get the API



Amazon Lightsail

App Environment



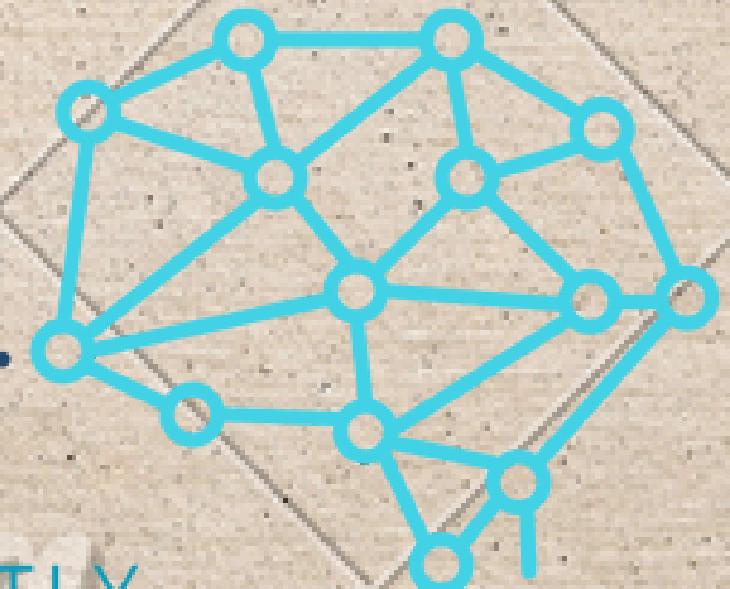
Amazon
EC2

wanted to establish a national park. The issue reached the Supreme Court as I crossed on that first day, and the future was unclear. There were many who wanted the park to be brought back to life anyway, I had

Conclusions

LitGraph





The next time anyone thought about who owned the basket was in the mid-eighties, when an advert in the *Vall Street Journal* offered the island for sale at \$100 million. That was the start of a long and contentious battle between a company based in Dingle, which had Taylor Collings's share of the land, and the Irish government – led at that time by Charles Haughey, the Taoiseach – which wanted to establish a national park there. It was still before the Supreme Court as I crossed the boat of the season, and the future was unclear, with signs of the island being brought back to life.

5