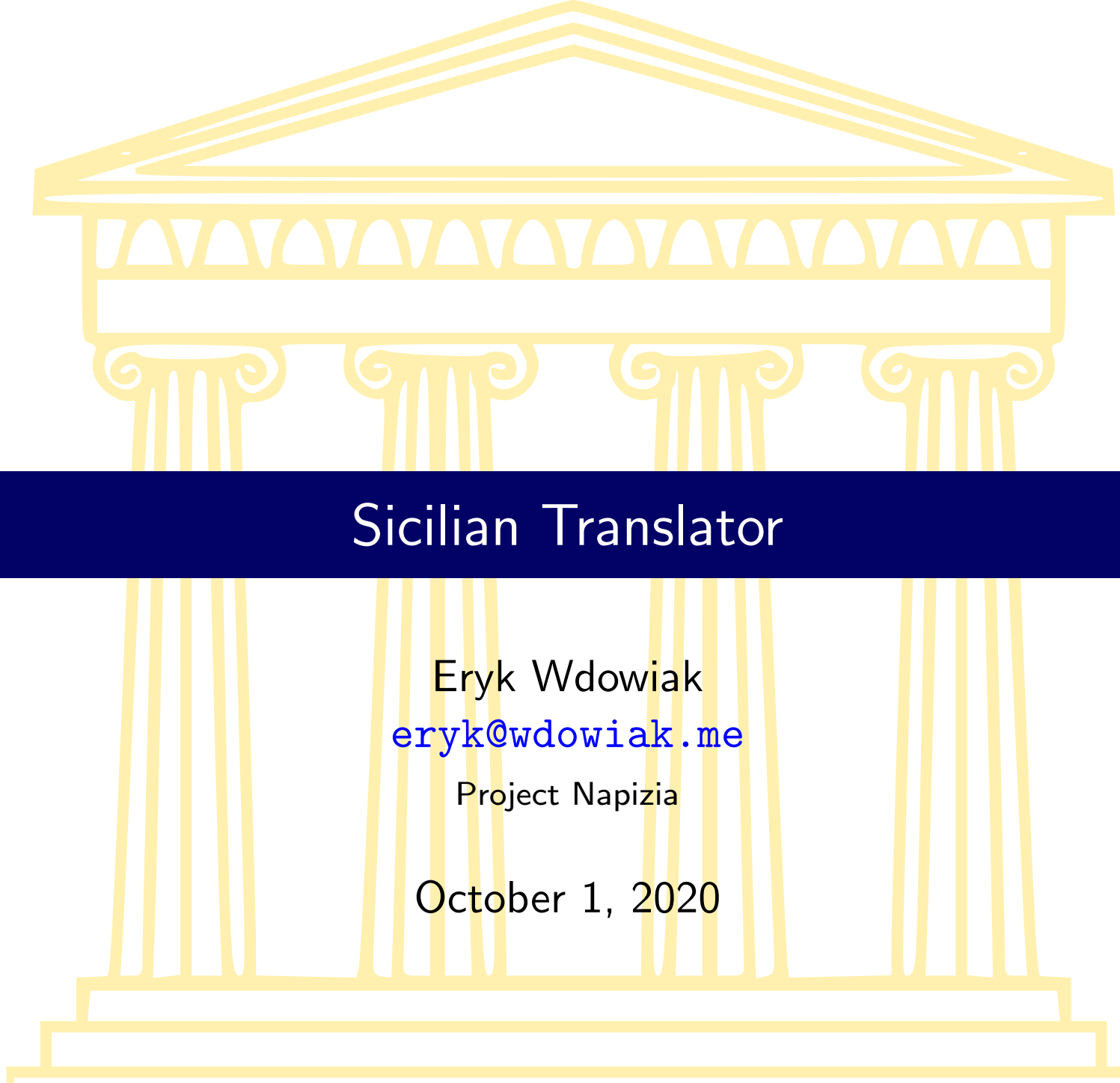

Sicilian Translator

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Why don't we have a Sicilian Translator?

- Google Translate doesn't translate Sicilian.
- Nor does Bing Translator, Yandex Translate or DeepL Translator.

- Why not? And what are we going to do about it?

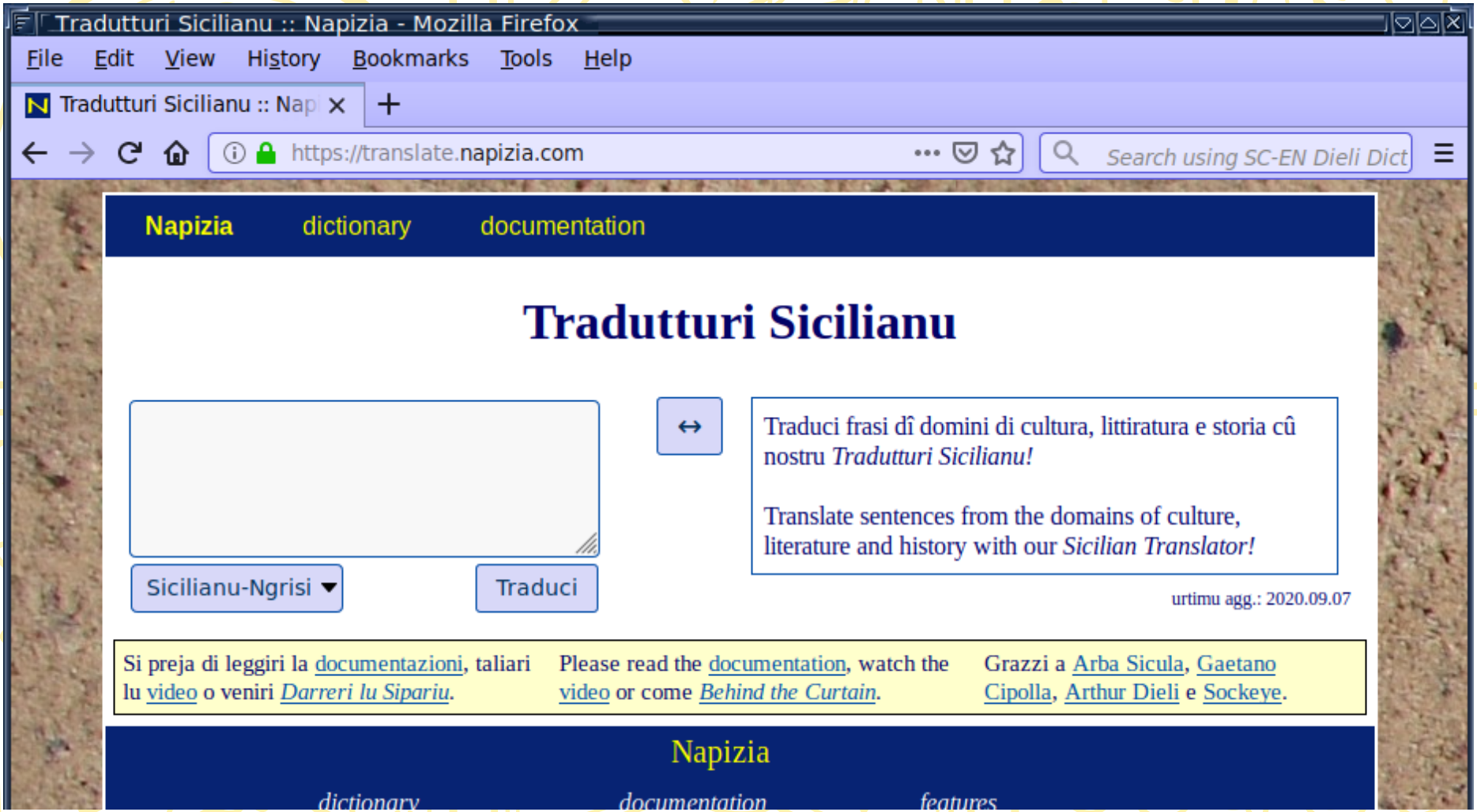
What is the Sicilian Language?

- The Sicilian School of Poets at the imperial court of Frederick II:
  - created the first literary standard in Italy (13th century)
  - inspired Dante, the "father of the Italian language"
- Sicilian emerged as a literary language before Italian.
- The people of Sicily, Calabria and Puglia speak it everyday.
  - They speak Italian at work.
  - But at home – with family and friends – they speak Sicilian.
  - More precisely, their own dialect of the language.
- And Sicilian is a language spoken here in Brooklyn, NY.

So why don't we have a Sicilian Translator?

- Because no one had assembled the parallel text to train a translator.
- It exists! Arba Sicula has been publishing a bilingual journal (and many other publications) for over 40 years.
- So we assembled the parallel text.

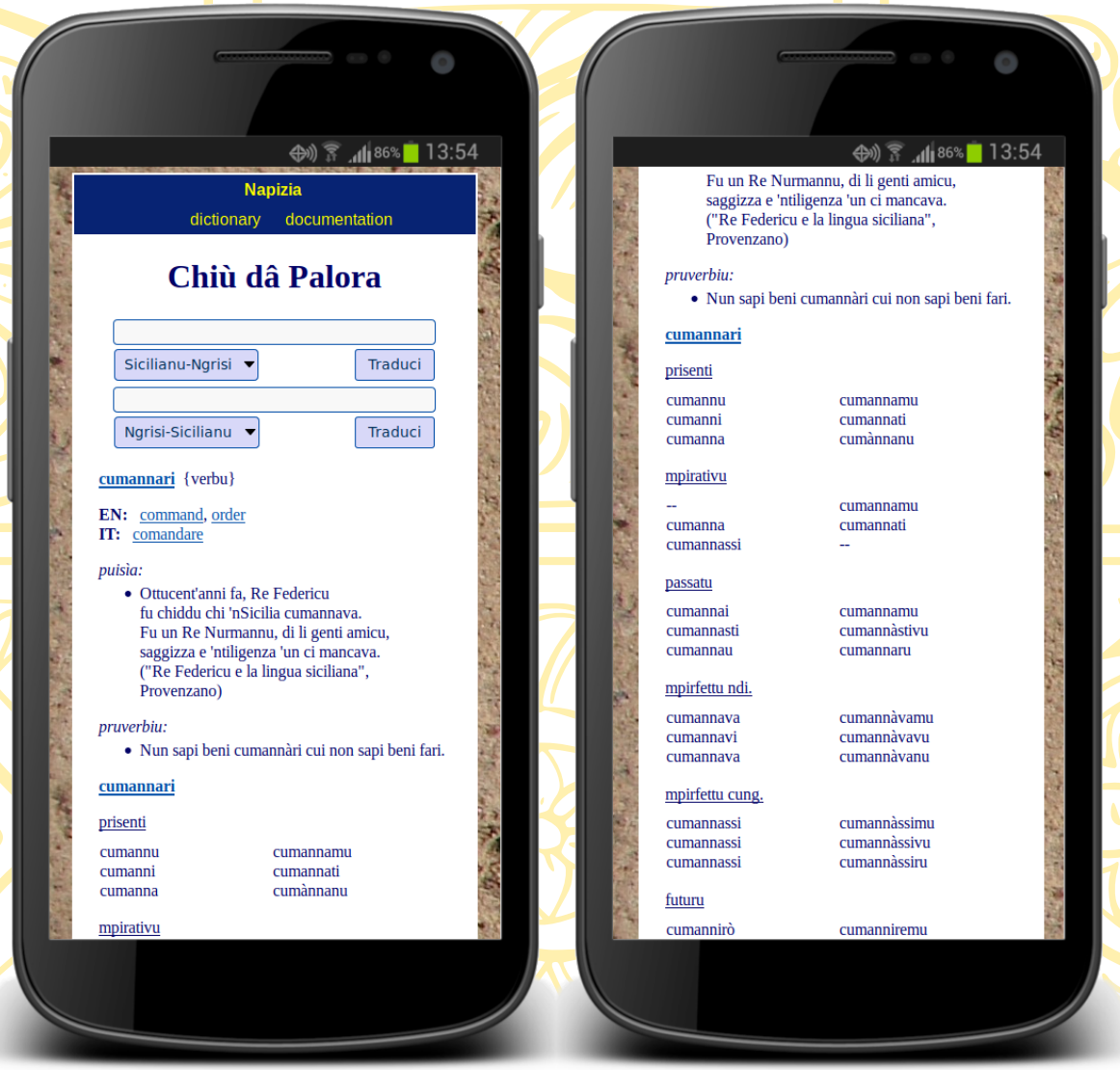
Sicilian Translator



How did we do it?

- We did **NOT** start with data collection.
- We started by collecting the rules of Sicilian vocabulary and grammar.
  - Arthur Dieli's *Sicilian Vocabulary*
  - Kirk Bonner's *Introduction to Sicilian Grammar* (2001)
  - Gaetano Cipolla's *Mparamu lu sicilianu* (2013)
- And we created the *Chiù dâ Palora* (*More About the Word*) dictionary.
  - vocabulary annotated with grammar, proverbs, poetry, prose and examples
  - provides a reference for standardizing Sicilian language text

More About the Word



Then We Began Collecting Data

- Sources of parallel text:
  - the bilingual literary journal *Arba Sicula*
  - A. Dieli's translations of Sicilian poetry, proverbs and G. Pitrè's *Folk Tales*
  - examples from G. Cipolla's *Mparamu* and K. Bonner's *Introduction*
- Data Preparation
  - Selected Sicilian language text that could be edited to Standard Sicilian.
  - Used *hunalign* to identify translated sentence pairs.
  - Manually edited the Sicilian language text for quality and standardization.
- Our parallel corpus (so far):
  - 14,494 lines for training – 196,911 Sicilian words, 202,652 English words
  - 121 hand selected for validation – 1836 Sicilian words, 1878 English words

And We Began Modeling

- We trained our translation models with Sockeye.
- Adding parallel text always improves translation quality more than adjusting hyperparameters.
- But some ways of training a model are better than others.
- We avoid overfitting by training:
  - a self-attentional Transformer model (Vaswani et al., 2017)
  - a smaller network with fewer layers (Sennrich and Zhang, 2019)
  - with small subword vocabularies (Sennrich, Haddow and Birch, 2016)
  - with high-dropout parameters (Srivastava et al., 2014)
- Large empirical improvements when we added theoretical knowledge:
  - by pushing the subword splitting toward "textbook" desinences
  - by using textbook examples to give structure to the sequences

Evaluating the Models

- Translation quality improves with parallel text. As our dataset grew from 120,000 to 200,000 words, our BLEU scores increased:
  - from 11.4 to 22.5 on English-to-Sicilian translation
  - from 12.9 to 25.2 on Sicilian-to-English translation
- Within a given dataset, pushing the subword splitting toward "textbook" desinences increased BLEU scores:
  - from 20.3 to 22.4 on English-to-Sicilian translation
  - from 21.4 to 24.1 on Sicilian-to-English translation
- We also observed larger increases in BLEU scores when we added parallel text from textbook examples than from other sources.
  - We did not conduct any formal tests to confirm this observation.
  - With our eyes, we could see the structure that textbook examples added.

Next Steps

- We still have more issues of *Arba Sicula* to extract text from.
- So we'll add more parallel text and further increase translation quality.

- We may also use the Sicilian text to train word embeddings and create lists of context similar words for our dictionary, *Chiù dâ Palora*.

- And we'll add more proverbs and poetry to the dictionary too.

Come to Napizia!

- So come to Napizia and try our *Tradutturi Sicilianu*.
- To see how it works "behind the curtain," come: *Darreri lu Sipariu*.
- To learn more, please read some of our documentation:
  - Sicilian Translator at Napizia
  - Introduction to Sicilian NLP
  - A Recipe for Low-Resource NMT
  - Sicilian Translator at Github
- We hope you'll join us. **Grazzi!**