

# SLOmet – Slovenian Commonsense Description

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# Outline

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# Motivation

- Commonsense is integral to our lives
  - Learn from mistakes & understand environment
  - Ex: Adrian drinks water, car
- Developed over time
- AI good at specialized tasks, unable to:
  - Infer commonsense from objects
  - Understand simple stories

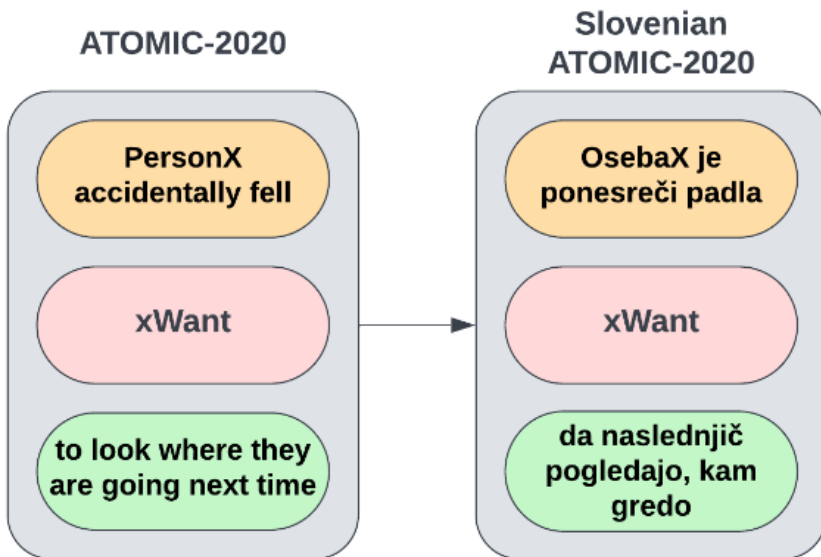


# Introduction

- AI for English commonsense
  - Deep Learning model trained on labelled sentences and entities
  - COMET (9 types), COMET-2020 (23 types)
- Multilingual commonsense
  - MultiCOMET - multilingually expand COMET
  - Proof of concept on Slovenian – English model, simple evaluation
- SLOmet
  - Translating commonsense data to Slovenian
  - Finetuning Slovenian language model
  - Comprehensive evaluation

# Data Description

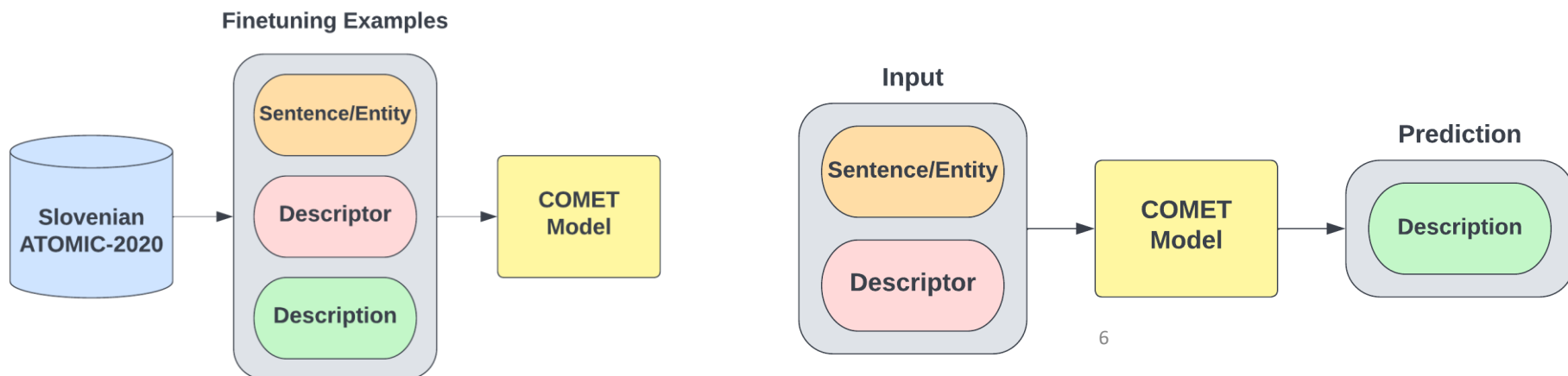
- Slovenian ATOMIC-2020 Dataset
  - 1.33 million commonsense descriptions
  - Amazon Turk, open-text
  - sentences & entities
  - 23 commonsense descriptors
  - Machine translation to Slovenian
    - 40,000 sentences and entities
    - 600,000 commonsense descriptions



	Head	Relation	Tail	Size
PHYSICAL-ENTITY	bread	ObjectUse	make french toast	165,590
		AtLocation*	basket; pantry	20,221
		MadeUpOf	dough; wheat	3,345
	baker	HasProperty*	cooked; nice to eat	5,617
		CapableOf*	coat cake with icing	7,968
		Desires*	quality ingredients	2,737
	Not Desires*	bad yeast	2,838	
EVENT-CENTERED	X runs out of steam	IsAfter	X exercises in the gym	22,453
		HasSubEvent	become tired	12,845
		IsBefore	X hits the showers	23,208
		HinderedBy	drinks too much coffee	106,658
		Causes	takes a break	376
	xReason	did not eat breakfast	334	
X watches ___ anyway	isFilledBy	the game; the TV	33,266	
SOCIAL-INTERACTION	X runs out of steam	xNeed	do something tiring	128,955
		xAttr	old; lazy; lethargic	148,194
		xEffect	drinks some water	115,124
		xReact	tired	81,397
		xWant	to get some energy	135,360
	X votes for Y	xIntent	to give support	72,677
		oEffect	receives praise	80,166
		oReact	grateful; confident	67,236
		oWant	thank X; celebrate	94,548

# Problem Description and Experimental Setting

- Given Slovene sentence/entity, predict Slovenian commonsense descriptions
- Finetuned two Slovenian GPT-2 language models
  - 1 million commonsense descriptions
  - macedonizer/sl-gpt2, gpt-janez
- Evaluation
  - Reference: English COMET-2020 GPT2-XL model
  - Metrics: BLEU, CIDEr, METEOR, ROUGE-L
  - 150,000 commonsense descriptions



# Experimental Results: Metrics

- Comparable performance to English
  - English model trained for longer, is larger
  - Translation errors
- All struggled with 4-grams (BLEU-4)
- COMET gpt-janez outperforms COMET sl-gpt2

Model	Language	BLEU-1	BLEU-2	BLEU-3	BLEU-4	CIDEr	METEOR	ROUGE-L
COMET sl-gpt2	Slovenian	0.297	0.150	0.086	0.058	0.487	0.207	0.383
COMET gpt-janez	Slovenian	0.324	0.174	0.108	0.076	0.508	0.225	0.397
COMET (GPT2-XL)	English	0.407	0.248	0.171	0.124	0.653	0.292	0.485

\*description quality between 0 and 1



# Experimental Results: Examples

*Marko je šel v trgovino (Marko went to the shop)*

Descriptor	COMET sl-gpt2	COMET gpt-janez	COMET (GPT2-XL)
oWant	Nič	Nič	None
	Se zahvaliti osebiX	Nič	To give him a receipt
	se zahvaliti	Nič	To give him a discount
IsBefore	Zaslužiti denar	Kupiti nekaj	PersonX buys a new car
	V trgovino za hišne ljubljence	Kupiti nekaj	PersonX takes the car back home
	V trgovino z živili	Kupiti nekaj	PersonX buys a new one

*Avto (car)*

Descriptor	COMET sl-gpt2	COMET gpt-janez	COMET (GPT2-XL)
ObjectUse	Vožnja do trgovine	Priti do hiše	Drive to the store
	Vožnja do hiše	Priti do hiše	Get to the store
	Vožnja do cilja	Priti do hiše	Drive to the restaurant
HasProperty	Noro	Najden v avtomobilu	Found in parking lot
	Vrata	Najden v avtomobilu	Found on road
	Pohištvo	Najden v avtomobilu	Found in car dealership

- English COMET overall performs best
- COMET gpt-janez performs well, fails to provide alternatives
- COMET sl-gpt provides alternative





# Demo: [multicomet.ijs.si](http://multicomet.ijs.si)

- All sentences include a subject/person (PersonX)

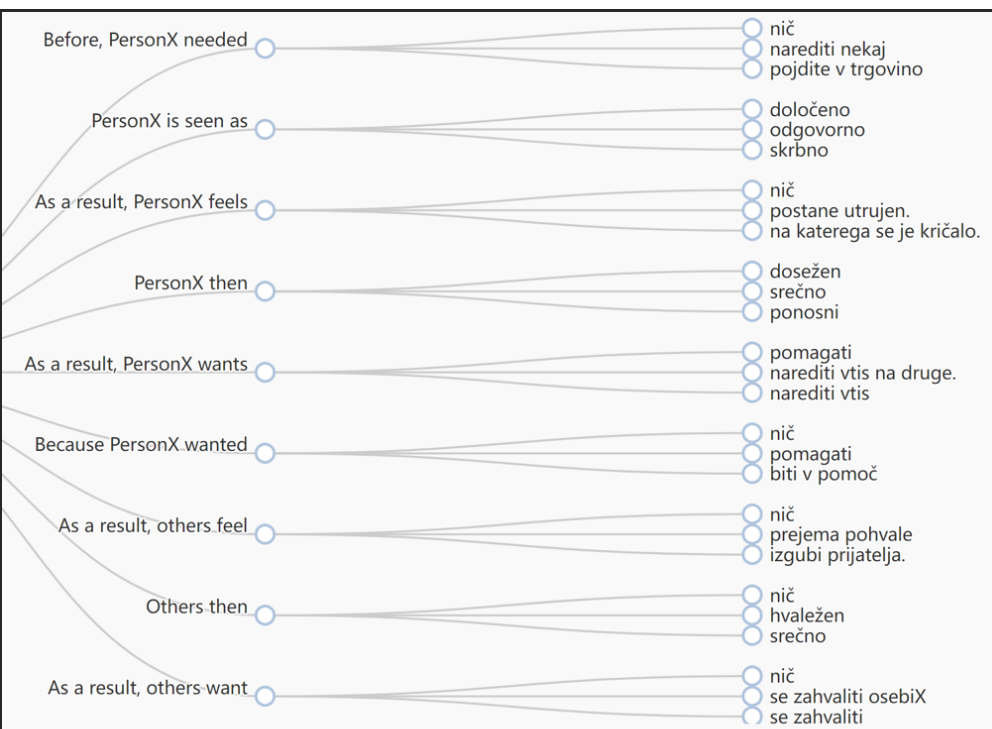


Figure 2 Close-up of “Social-Interaction” descriptor values predicted for an example Slovene sentence “John is very important” (“Janez je zelo pomemben” in Slovenian)

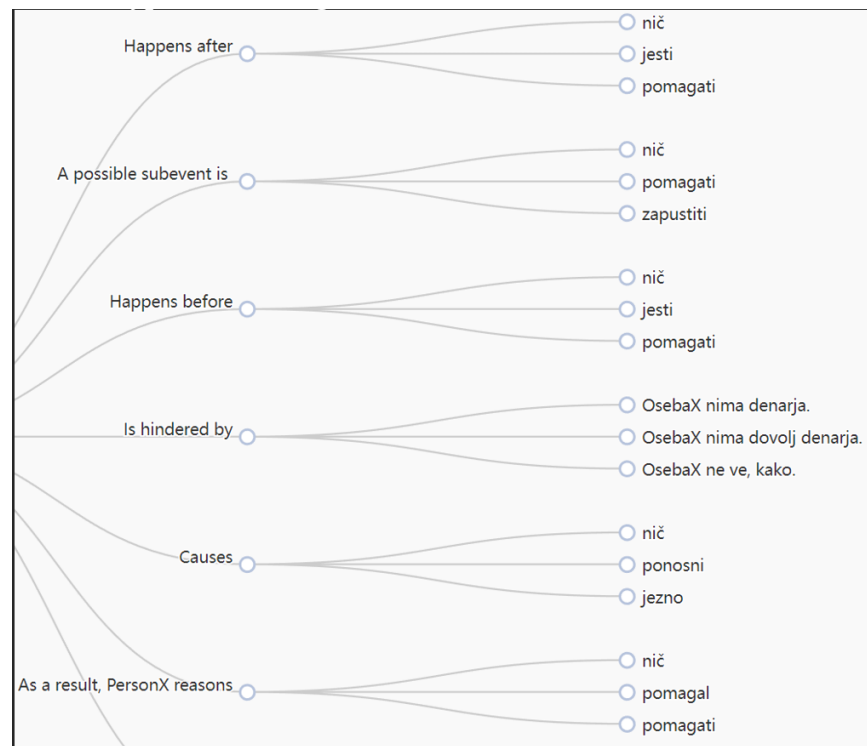


Figure 1 Close-up of “Event-Centered” descriptor values predicted for an example Slovene sentence “PersonX is sad” (“OsebaX je žalostna” in Slovenian)

# Discussion

- Main Contributions
  - Slovenian ATOMIC-2020 dataset, [publicly available](#)
  - Comparison of English and Slovenian commonsense models
  - Comprehensive evaluation with four metrics
- Future Work
  - Evaluate individual descriptors
  - Expand to different languages
  - Web app for 100+ languages & API

Code publicly available on [GitHub](#)