**Austrian
Research Institute
for Artificial Intelligence**

OFAI

ABOUT NEWS EVENTS RESEARCH ▾ PUBLICATIONS PEOPLE

OFAI Headquarters
Vienna, Austria

Austrian Research Institute for Artificial Intelligence

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ABOUT   NEWS   EVENTS   RESEARCH ▾   PUBLICATIONS   PEOPLE

- Natural Language Processing

- Machine Learning

- Robots and Cobots

- Companion Technologies – Virtual Agents and Social Robots

- Arts and AI

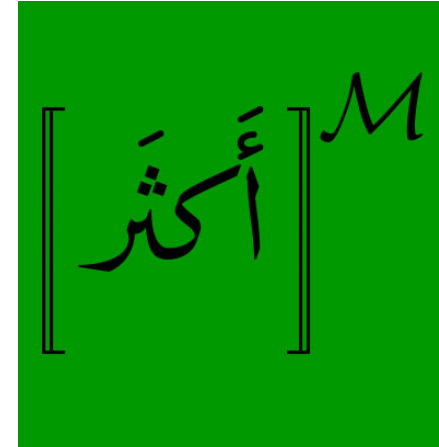Basic Research ⟷ Applied Research

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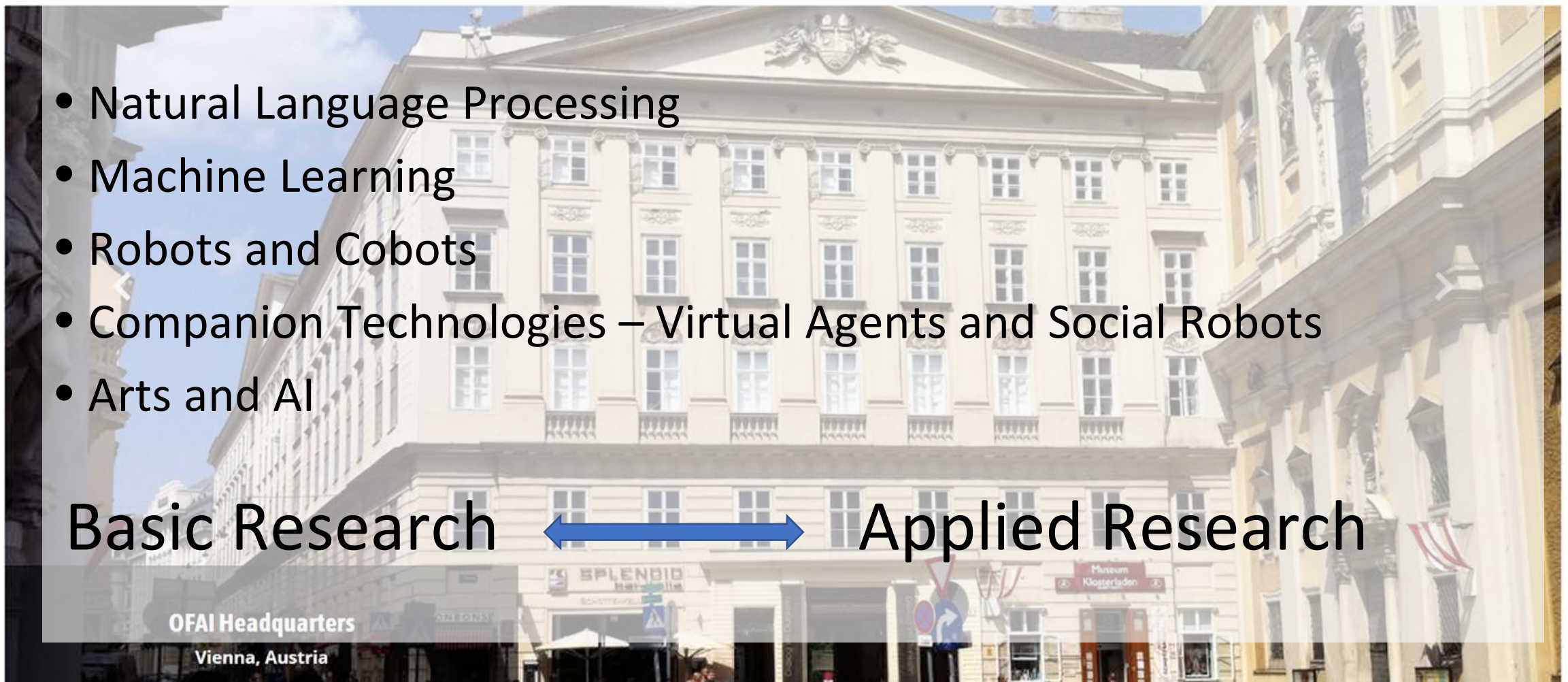
Arabic Linguistics

- Aspects of noun phrase structure in Arabic

- Arabic degree semantics

- Contrastive linguistics – Arabic, German, English

- Historical linguistics – development of the modern Arabic dialects

Hallman, Peter (2023) "Superlative Displacement in Sandwich Scenarios," Natural Language Semantics.
Hallman, Peter (2023) "Equative Degree Quantification in Damascene Arabic," in Azaz, Mahmoud (ed.) "Perspectives on Arabic Linguistics XXXIV," John Benjamins Publishing Company, Amsterdam, pp. 185-210.
Hallman, Peter (2022) "Comparative Constructions in Syrian Arabic," Brill's Journal of Afroasiatic Languages and Linguistics 14(2):210-254.
Hallman, Peter and Rashid Al-Balushi (2022) "Pronominalization and Clitic Doubling in Syrian and Omani Arabic," Linguistics.
Hallman, Peter (2022) "Scope Splitting in Syrian Arabic," Natural Language Semantics 30:47-76.

http://www.peterhallman.com/

Computational Humor

- Translation of word play/humor:
  - Computer-assisted wordplay translation (PunCAT)
  - Machine translation of humour (JokR)
- Learning humour preferences
- Style-conditioned poetry generation
- Computational linguistics analysis of puns
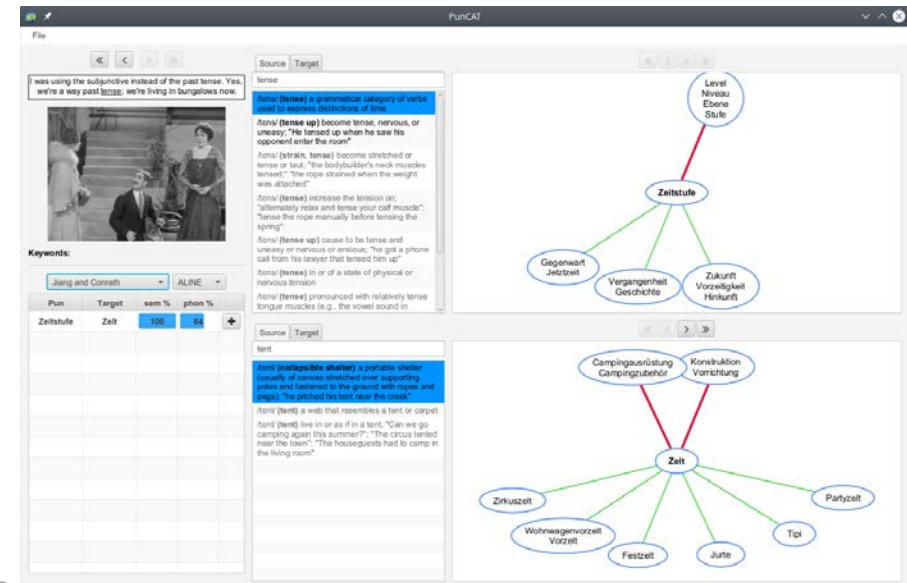
Liana Ermakova, Anne Gwenn-Bosser, Adam Jatowt, and Tristan Miller. The JOKER corpus: English–French parallel data for multilingual wordplay recognition. In SIGIR '23: Proceedings of the 46th International ACM SIGIR Conference on Research and Development in Information Retrieval, New York, NY, 2023. Association for Computing Machinery. ISBN 978-1-4503-9408-6. DOI: 10.1145/3539618.3591885. To appear.
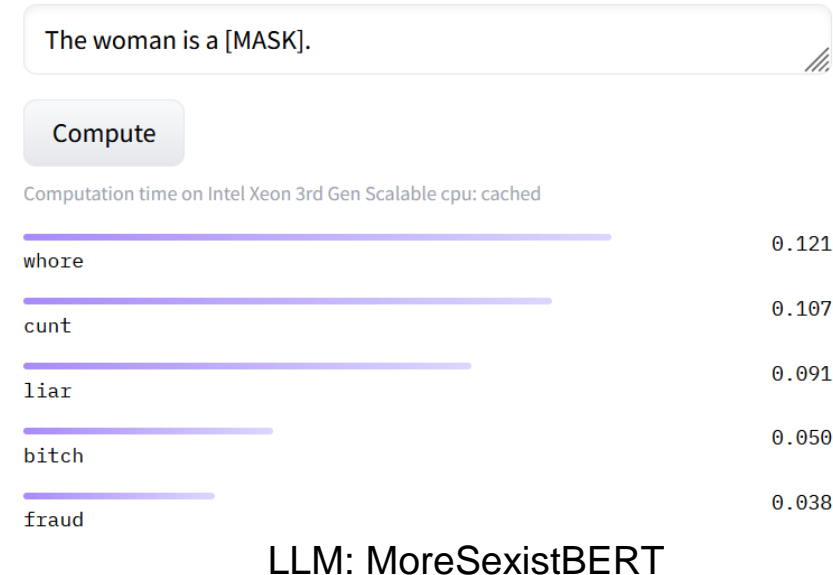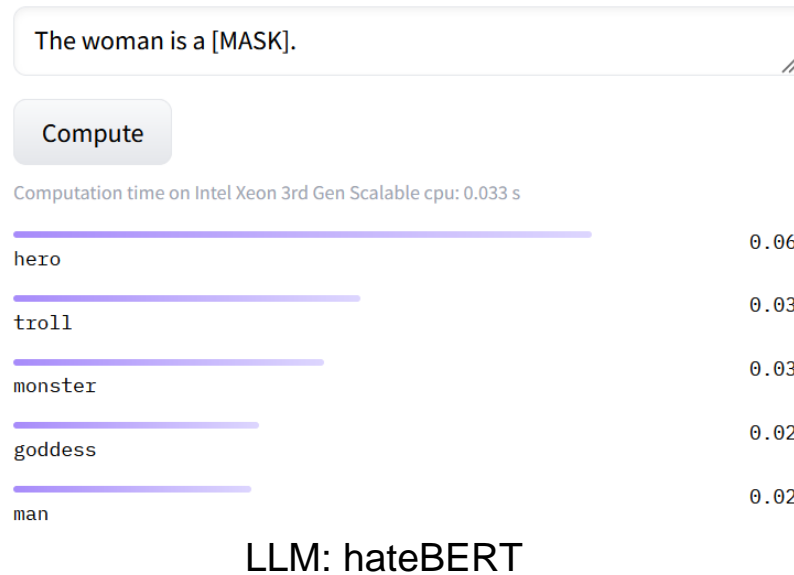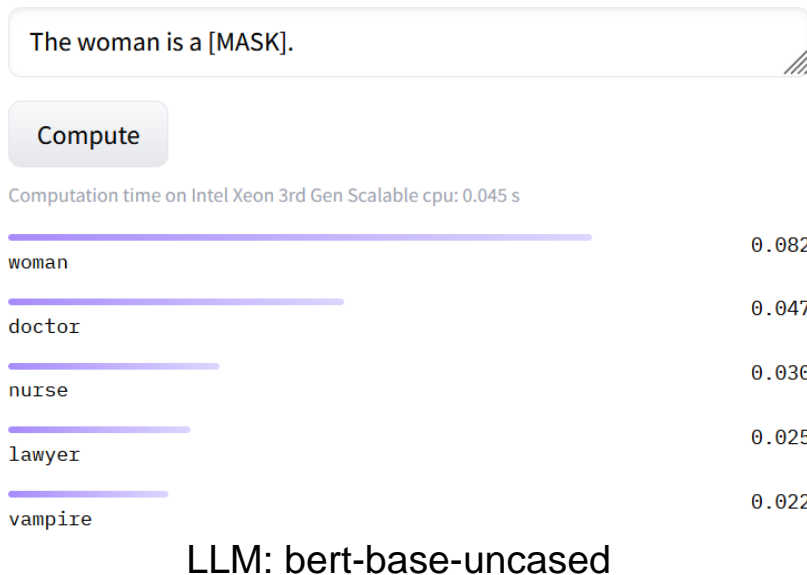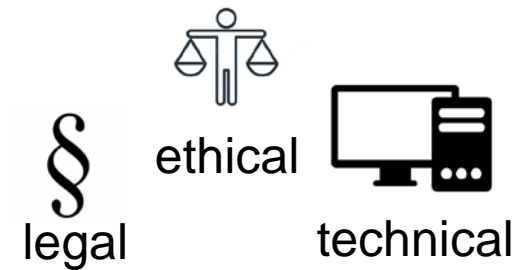
Liana Ermakova, Tristan Miller, Anne-Gwenn Bosser, Victor Manuel Palma Preciado, Grigori Sidorov, and Adam Jatowt. Overview of JOKER – CLEF-2023 track on automatic wordplay analysis. In Avi Arampatzis, Evangelos Kanoulas, Theodora Tsikrika, Stefanos Vrochidis, Anastasia Giachanou, Dan Li, Mohammad Aliannejadi, Michalis Vlachos, Guglielmo Faggioli, and Nicola Ferro, editors, Experimental IR Meets Multilinguality, Multimodality, and Interaction: Proceedings of the Fourteenth International Conference of the CLEF Association (CLEF 2023), Lecture Notes in Computer Science, Cham, 2023. Springer. To appear.

Waltraud Kolb and Tristan Miller. La interacción entre el hombre y la máquina en la traducción de juegos de palabras [Human–computer interaction in pun translation]. In Laura Mejías-Climent and Julio de los Reyes Lozano, editors, La traducción audiovisual a través de la traducción automática y la posedición: prácticas actuales y futuras. Comares, Granada, 2023. Translated by Lorena Pérez Macías. To appear.

https://logological.org/

Machine Learning and Ethics

Ekip – A Platform for Ethical AI Applications

- Researching constraints for good and trustworthy AI applications
- Gender bias in large language models

legal   ethical   technical

The woman is a [MASK].		
Compute		

Computation time on Intel Xeon 3rd Gen Scalable cpu: 0.045 s

woman		0.082
doctor		0.047
nurse		0.030
lawyer		0.025
vampire		0.022

LLM: bert-base-uncased

The woman is a [MASK].		
Compute		

Computation time on Intel Xeon 3rd Gen Scalable cpu: 0.033 s

hero		0.067
troll		0.039
monster		0.036
goddess		0.028
man		0.027

LLM: hateBERT

The woman is a [MASK].		
Compute		

Computation time on Intel Xeon 3rd Gen Scalable cpu: cached

whore		0.121
cunt		0.107
liar		0.091
bitch		0.050
fraud		0.038

LLM: MoreSexistBERT

Text-To-Speech (TTS)

Modeling Austrian standard and dialect speakers (Viennese, Bad Goisern, Innervillgraten) using FastSpeech 2

New possibility: **Shift speaker from standard to dialect**

How?

1.) Extract dialect embeddings

– wav2vec system trained on 436k hours of speech. Finetuned for Language Identification (LID)

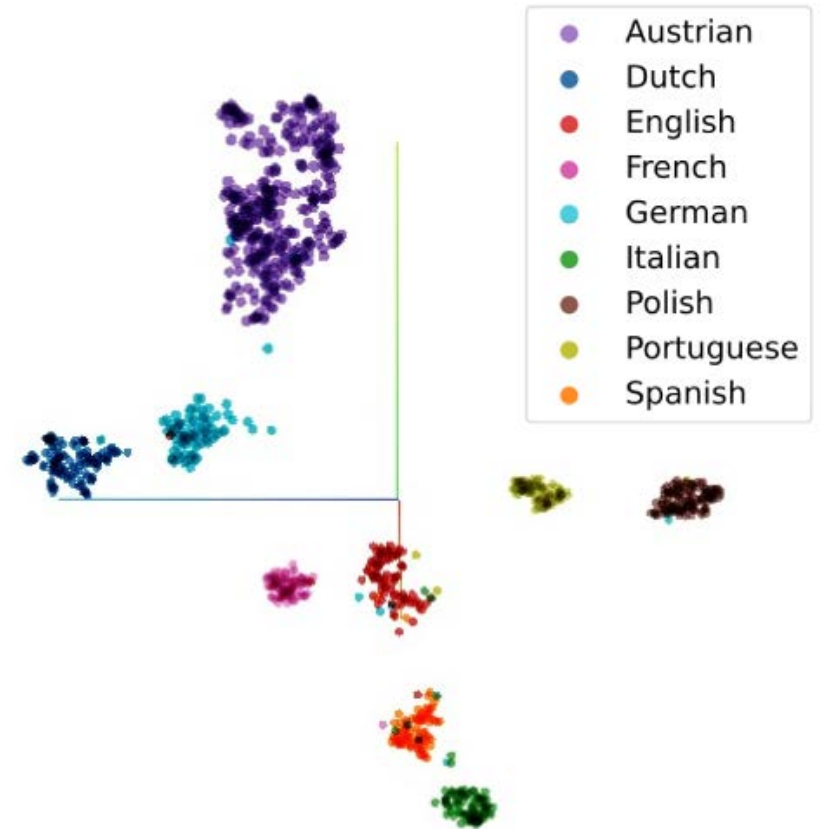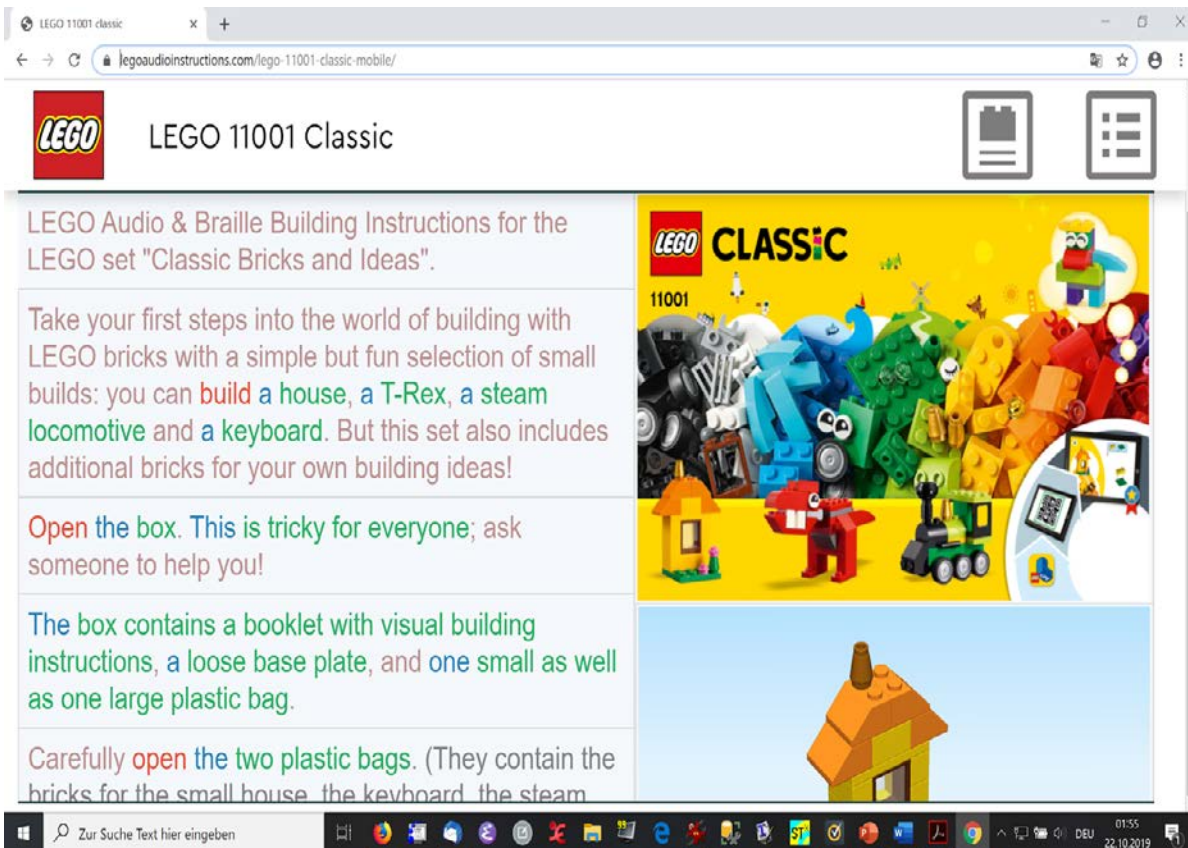2.) Jointly train TTS

Interface available under: https://demo.ofai.at/speech/

Austrian
Dutch
English
French
German
Italian
Polish
Portuguese
Spanish

Fig.: Visualization of language embeddings from European languages

L. Gutscher, M. Pucher, V. Garcia, "Neural Speech Synthesis for Austrian Dialects with Standard German Grapheme-to-Phoneme Conversion and Dialect Embeddings", in Proc. Special Interest Group on Under-resourced Languages (SIGUL), Aug. 2023, Dublin [accepted].

# Lego Audio Instructions for Visually Impaired

- Linguistic analysis of verbal building instructions

- Creation of verbal and phrasal resources

- Modelling of xml-coded Lego-internal representations

- Mapping of lexical resources into building steps

- Generation of verbal utterances per building step

- Text to Speech

https://legoaudioinstructions.com/   https://www.ofai.at/projects/lego

Human-R/Cobot Collaboration

CoBot Studio – Crossing Realities for Mutual Understanding in Human-Robot Teams
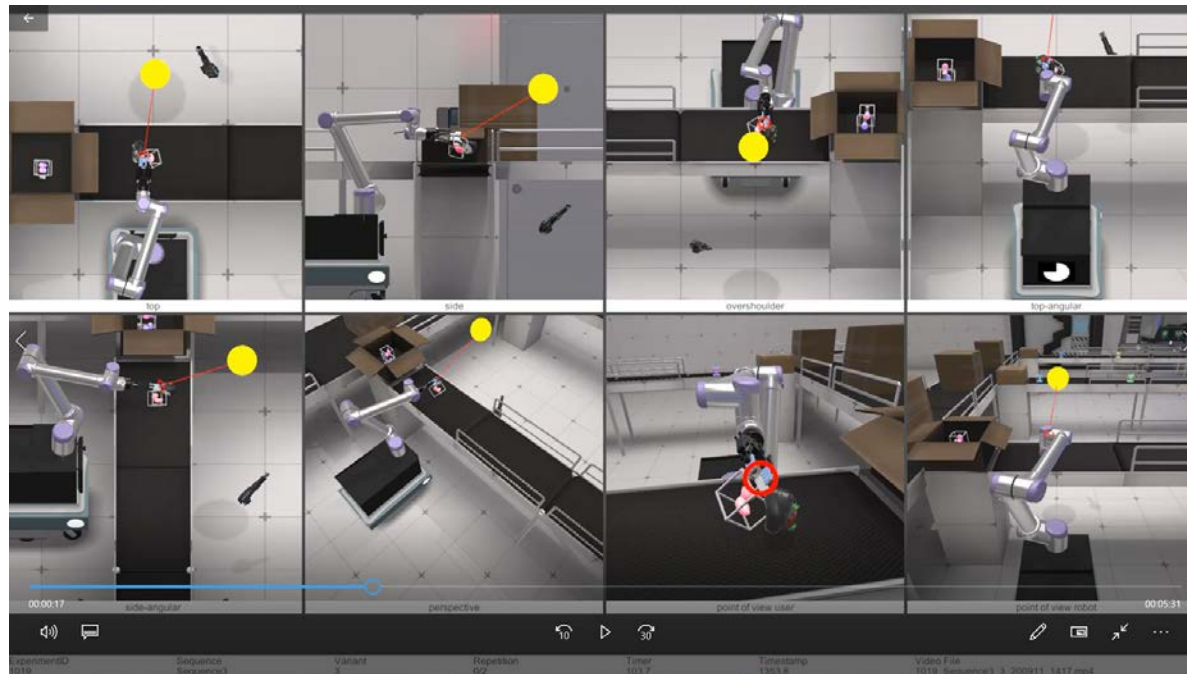
Gross, S., & Krenn, B. (2023). A Communicative Perspective on Human–Robot Collaboration in Industry: Mapping Communicative Modes on Collaborative Scenarios. *International Journal of Social Robotics*, 1-18.
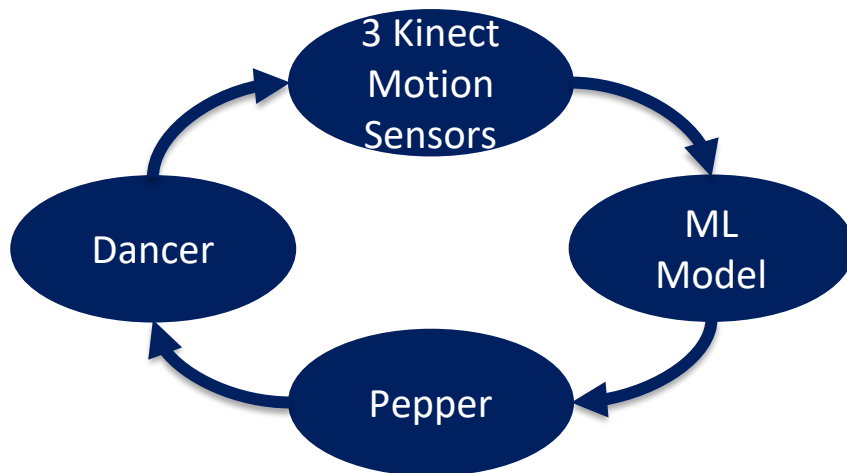
https://www.ofai.at/projects/cobotstudio
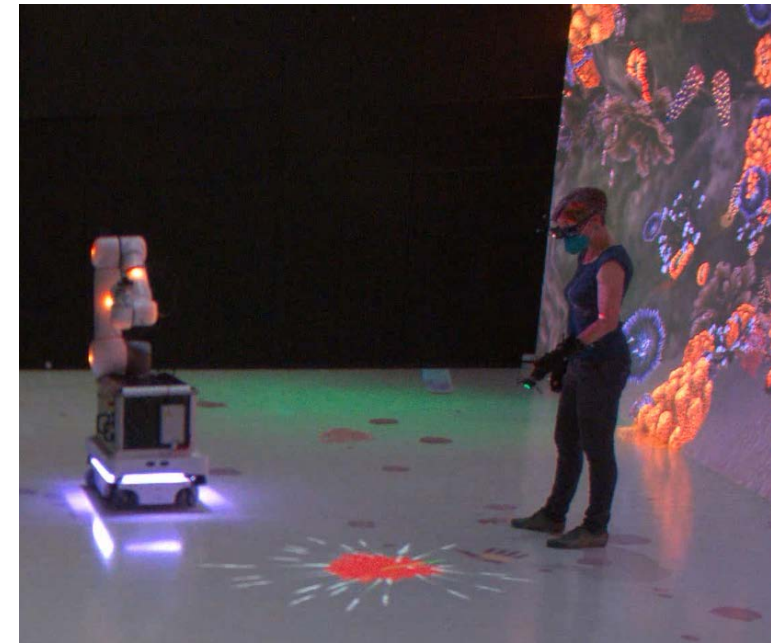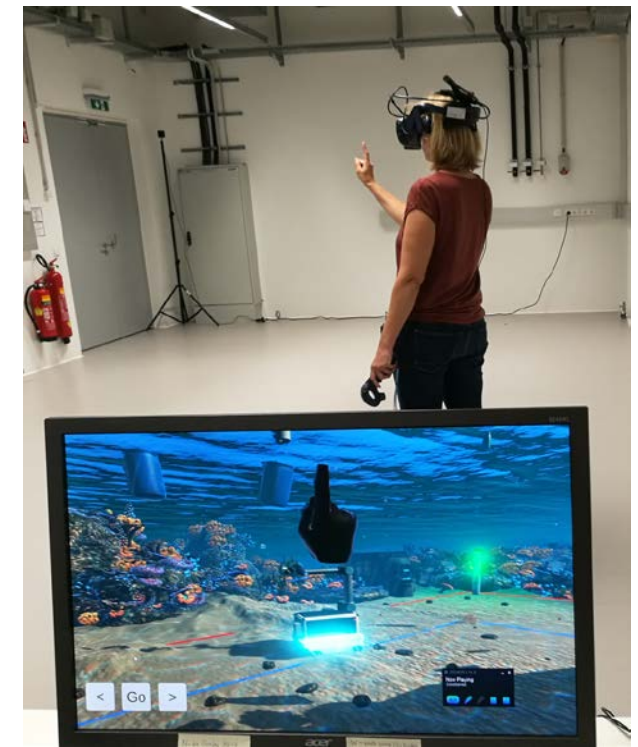
The importance of mutual attention and attention direction!

Arts & AI

DANCR

- Researching a robotic system as an
  improvisation partner
  in contemporary dance

Eva-Maria Kraft ©Michael Loizenbauer

3 Kinect Motion Sensors → ML Model → Pepper → Dancer → (3 Kinect Motion Sensors)

END

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