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Motivation

Many deaf and hard-of-hearing individuals rely on sign language (SL) on a daily basis as a preferred language [1]. Although nowadays there are significant advances on spoken language research, current approaches are often neither linguistically motivated nor tailored to the unique features of SLs [2]. Further research and development are necessary to enhance Sign Language Machine Translation (SLMT) and bring it to a similar level as spoken language MT. This research will endeavour to improve the accuracy and efficiency of SLMT systems, making them more accessible to the Deaf community and empowering deaf and hard of hearing individuals to communicate more effectively with the rest of the world.

Research Objectives

- Research the literature in relation to sign language linguistics, in particular ISL.
- Research computational linguistic approaches to addressing the challenges of modelling and processing sign languages.
- Generate a translation model that generates Irish sign language (ISL) from English (text).
- Leverage avatar technology to generate ISL as output from our text-to-sign machine translation system.

Methodology

- Explore what theory of grammar is most appropriate.
- Explore what 3D graphics is most appropriate to develop the avatar.
- Develop out MT model including lexicon entries.
- Develop scripting language to link the lexicon animation interface.
- Drive avatar synthesis of ISL using lexicon entries which are realised by the scripting language.

Methodology

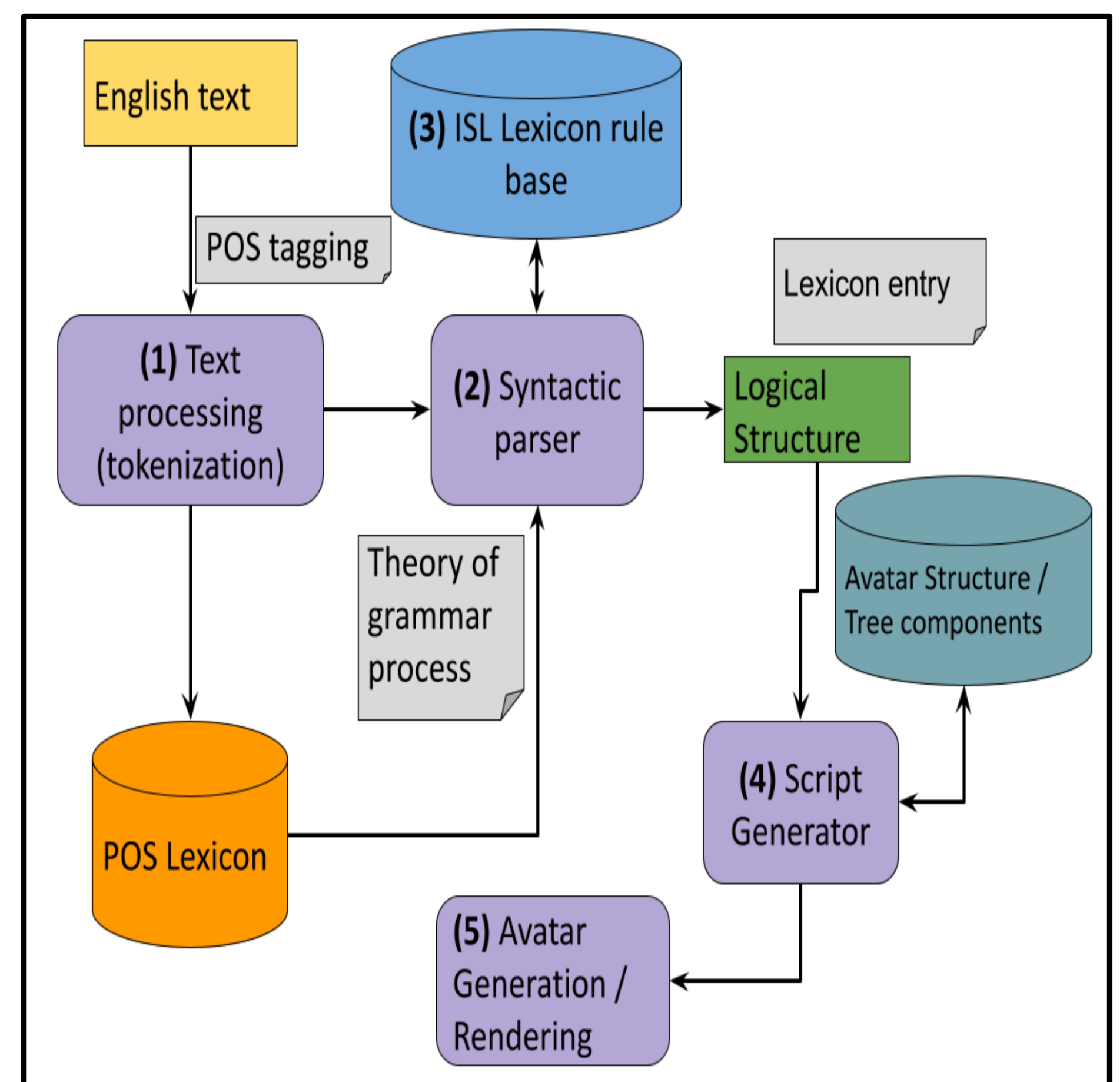


Figure 1. Translation process architecture

Outputs

- A computational model of machine translation that will translate between English (text) and Irish Sign Language (ISL).
- An Avatar to represent the translation.

References

1. Murtagh, I., Moisselle, R., Leeson, L.: Sign languages and language technology: Linguistic and technical challenges (2021). Irish Association of Applied Linguistics conference presentation. University College Dublin, Ireland.
2. De Coster, M., Shterionov, D., Van Herreweghe, M. et al. Machine translation from signed to spoken languages: state of the art and challenges. Univ Access Inf Soc (2023).