Incremental Relevance in Dialogue and Disfluency Processing

Julian Hough

It has been established from psycholinguistics that disfluencies such as self-repairs, filled pauses and hesitations have meaning in dialogue which requires computing, rather than being filtered out as noise. Computing this meaning for a dialogue system or formal dialogue model is challenging: it requires breaking free of traditional notions of grammar and the traditionally conceived competence-performance distinction (Chomsky, 1965). It requires modelling semantic update for dialogue participants' states on at least as fine-grained a level as word-by-word and taking linguistic actions to be first class citizens of the context, in addition to time.

Here I present a formal model to do this using elements of the Incremental Unit (IU) framework (Schlangen and Skantze, 2011) and Dynamic Syntax with Type Theory with Records (DS-TTR) (Purver et al., 2011), an inherently incremental grammar formalism. I then discuss an approach to modelling real-time probabilistic inference from disfluency in accordance with Brennan and Schober (2001)'s results in a simple referring expression game, namely by integrating this model into probabilistic TTR with a simple but real-valued notion of relevance for questions under discussion.

We discuss the implications of this for dialogue semantics and relevance. This is part of the Bielefeld and Paris 7 colloborative DUEL ('Disfluencies, Exclamations and Laughter in dialogue') which aims to produce both a formal dialogue model and working dialogue system that can process disfluencies.