

Incremental Graph-based Semantics & Reasoning for Conversational AI

The next generation of conversational AI systems need to:

- (1) process language incrementally, token-by-token to be more responsive and enable handling of conversational phenomena such as pauses, restarts and self-corrections;
- (2) reason incrementally allowing meaning to be established beyond what is said;
- (3) be transparent and controllable, allowing designers as well as the system itself to easily establish reasons for particular behaviour and tailor to particular user groups, or domains.

In this paper we present preliminary work combining Dynamic Syntax (DS) - an incremental, semantic grammar framework - with the Resource Description Framework (RDF). This paves the way for the creation of incremental semantic parsers that progressively output semantic RDF graphs as an utterance unfolds in real-time. We also outline how the parser can be integrated with an incremental reasoning engine through RDF. We argue that this DS-RDF hybrid satisfies the desiderata listed above, yielding semantic infrastructure that can be used to build responsive, real-time, interpretable Conversational AI that can be rapidly customised for specific user groups such as people with dementia.