

The FSD Project, a biomedical ontology for improved individual diagnoses and treatment of Female Sexual Dysfunction

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Emotional Brain BV is a scientific research institute, whose aim it is to develop instruments for scientific analyses of individual malfunctioning, i.e. diagnoses and treatments. For any given disease, only a percentage of all patients respond to medication appropriately. One of our main research activities is the development of a treatment for Female Sexual Dysfunction (FSD). To be able to predict which patients will benefit from this medication and which patients may require other intervention, we have developed the FSD Project, a biomedical ontology that contains relevant biomedical and psychological knowledge about FSD.

The FSD Project connects to a patient database with personal individual characteristics. By linking the ontology content to a (multi-agent) reasoning tool, we are able to predict a multitude of further conditions that apply to these patients. Not only does this render personalised diagnoses and treatment suggestions, it also reveals future research avenues.

The knowledge for predicting individual patient conditions is formalised in forward and backward chaining rules. Several hundred rules are specified manually by domain experts based on systematic literature reviews, or are harvested automatically from the knowledge in the FSD Project based e.g. on aggregation and generalisation relationships.

Protégé allows domain experts -who are not computer science experts- to model chaining rules, and to generate decision support tools. The instant feedback between manipulating knowledge in Protégé and seeing the possible (end) result in decision support tools provides the domain experts with the unique ability to understand the effects of their input knowledge. This direct feedback permits researchers to pose "what if" questions on patient databases; and simulate e.g. if given medication could result in desired behaviour. The FSD project can also automatically generate dynamic decision trees and business logic for web services from the FSD project. This allows engineers to rapidly prototype and develop decision trees for medical protocols and other applications.