

GoCom – a Guideline-based Goal-oriented Methodology for Treating Patients with Multimorbidity and Its Preliminary Evaluation

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Abstract

Physicians are burdened with vast amounts of information when treating multimorbidity patients—a common situation with the aging population. We developed a goal-oriented methodology—“GoCom”(Goal-Comorbidities)[1] for continuous management of multimorbidity patients that aims to imitate the thought process of physicians by detecting and mitigating interactions among patients’ diseases and treatments. GoCom utilizes standardized medical ontologies(NDF-RT), terminologies(MedDRA) and patient-information standards(HL7-FHIR). When a diagnosis or treatment are registered, GoCom retrieves patient-specific recommendations from Computer-Interpretable Guidelines modeled in PROforma (a Task Network Model). The recommendations are converted into hierarchical goal-oriented forest structures, with goal-trees for each morbidity, where high-level goals are tree nodes and low-level treatment goals are leaf-nodes. The algorithm uses behavioral patterns to generate explanations, satisfy as many goals in the patient-forest as possible, and minimize negative effects. GoCom was evaluated with 6 complex multimorbidity case-studies and was shown to increase completeness and correctness of patient management by medical students with statistical significance.

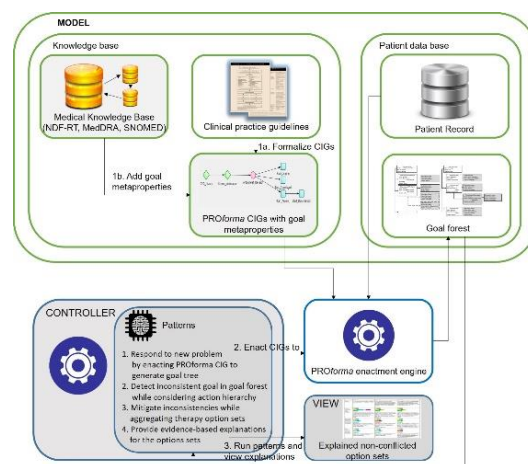


Figure 1. System architecture

[1] Kogan, A., Peleg, M., Tu, S. W., Allon, R., Khaitov, N., & Hochberg, I. (2020). Towards a goal-oriented methodology for clinical-guideline-based management recommendations for patients with multimorbidity: GoCom and its preliminary evaluation. *Journal of Biomedical Informatics*, 112, 103587.