OpenReq

Personal Recommendations in Requirements Engineering: The OpenReq Approach A Research Preview

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Introduction



RE is critical for successful software development

High quality of RE

How to achieve it when thousands of requirements, stakeholders and feedback are involved?

- Requirements and stakeholder discovery is difficult!
- Reaching a decision is difficult!
- Requirements quality is difficult!



Introduction

- Use of Recommender systems (RSs) to help in some of the tasks
 - Help to find information...
 - Help to make decisions...
 - ... in situations where stakeholder's lack experience
 - ... in situations where they cannot consider all the data at hand

However, the majority of RSs in RE focus on specific tasks



OpenReq – H2020 European Project



GOAL: Develop intelligent recommendation and decision technologies (based on Al techniques) to give support to requirement analysts during different RE stages







- What is a personal recommendation?
 - Consider stakeholders as individuals...
 - ...in contrast to group recommendations
- Types of personal recommendations (marked by the project!):
 - A. Recommendation of relevant requirements
 - B. Improvement of requirements quality
 - C. Prediction of requirements properties
 - D. Identification of relevant stakeholders
 - E. Context-aware recommendations











A. Recommendations of relevant requirements	 1. Identification of actual requirements I.e. text that contains requirements in contrast to text that does not bring information 2. Identification of similar requirements From the same or past projects 3. Identification of related requirements From the same or past projects 	Content-based		Improved by: 1) Domain ontologies, 2) Semantic models	lations	Context observer
B. Recommendations about quality of	1. Measure the quality of requirements To identify bad quality requirements	Set of rules for qu	ality properties		scommend	
requirements	2. Tips for improving the quality E.g. change of words (to homogenize vocabulary or reduce ambiguity) or adding missing information	NLP techniques	Knowledge-based recommenders	l	ext-aware re	or push specific context
C. Recommendations for requirement properties	To predict key properties of requirements, e.g. prioritization	Approaches of A.2 (if the task is reduced to a similarity problem)	n-classifier		E. Cont	To determine whether pull or push ecommendations are needed in a specific.
D. Recommendations of relevant stakeholders	To identify stakeholders that can cooperate on the definition of requirements	Approaches of C (if stakeholders are considered a property)	Collaborative recommenders + Social networks			To deto recommendat











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B. Recommendations about quality of	1. Measure the quality of requirements To identify bad quality requirements	Set of rules for q	uality properties		ecommen	
	3. Identification of related requirements From the same or past projects	Content-based + Collabor recommenders + recomm		Improved ontologies, 2)	dations	
	2. Identification of similar requirements From the same or past projects	Content-based recommenders	NLP + VSM + Similarity metrics	Improved by: 1) ologies, 2) Sema		
A. Recommendations of relevant requirements	1. Identification of actual requirements I.e. text that contains requirements in contrast to text that does not bring information	Binary classifier + I	NLP techniques	by: 1) Domain Semantic models		





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Conclusions

- Personal recommendations in OpenReq to improve and speed-up RE:
 - Combination of state-of-the-art RSs and NLP algorithms/techniques
- OpenReq will provide:
 - A new RE solution API Interfaces to existing RE tools (e.g. DOORs, Jira)
- OpenReq prototype (currently) includes:
 - Recommendation of relevant requirements
 - Group decision making
 - Conflict resolution



Thank you! Questions?





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