

VU Research Portal

Supporting trial recruitment and design by automatically interpreting eligibility criteria

Milian, K.

2014

document version

Publisher's PDF, also known as Version of record

[Link to publication in VU Research Portal](#)

citation for published version (APA)

Milian, K. (2014). *Supporting trial recruitment and design by automatically interpreting eligibility criteria*. [PhD-Thesis - Research and graduation internal, Vrije Universiteit Amsterdam].

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

Take down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

E-mail address:

vuresearchportal.ub@vu.nl

Contents

Acknowledgements	vi
1 Introduction	1
1.1 Motivation	1
1.2 Research questions	2
1.3 Background	4
1.4 Data	8
1.5 Approach	9
1.6 Contributions	11
1.7 Publications	12
1.8 Thesis Outline	13
2 Identifying subsets from ontologies relevant for a medical domain	15
2.1 Identifying subsets of ontologies related to treatment of a disease	17
2.1.1 Introduction	17
2.1.2 Two types of disease-centric subdomains	18
2.1.3 Seed query method to find key concepts	20
2.1.4 Mapping of guidelines to find relevant concepts	23
2.1.5 Evaluation of the two methods	28
2.1.6 Related work	30
2.1.7 Summary and Conclusions	32
2.2 Identifying subsets of ontologies related to clinical trials	35
2.2.1 Introduction	35
2.2.2 Defining a strategy	36
2.2.3 Estimating effort	40

2.2.4	Prioritizing concepts	43
2.2.5	Related work	45
2.2.6	Conclusions	46
3	Structuring content of eligibility criteria	49
3.1	Language patterns of eligibility criteria	50
3.1.1	Patterns of eligibility criteria	50
3.1.2	Patterns detection	55
3.1.3	Coverage of criteria from different domains	56
3.1.4	Related work	60
3.1.5	Conclusions and future work	61
3.2	Evaluation of patterns approach	63
3.2.1	Introduction	64
3.2.2	Methods	65
3.2.3	Evaluation approach	66
3.2.4	Results	75
3.2.5	Related work	83
3.2.6	Conclusion	85
4	Mapping eligibility criteria to patient data model	87
4.1	Introduction	88
4.2	Structuring eligibility criteria	89
4.3	From structured criteria to queries	90
4.3.1	Patient data representation	91
4.3.2	Mapping structured criteria to openEHR archetypes	91
4.3.3	Query templates	94
4.4	Limitations and future work	97
4.5	Related work	98
4.6	Conclusion	99
5	Determining patient eligibility	101
5.1	Background	103
5.2	Objective	103
5.3	Materials and Methods	104
5.3.1	Experiment setting	104
5.3.2	Patient-trial matching method	105
5.3.3	Evaluation	109
5.4	Results	110
5.4.1	Evaluation of trial matching	110

5.4.2	Applicability of partial patient data	113
5.5	Discussion	114
5.5.1	Related work	116
5.6	Significance	118
5.7	Conclusions	118
6	A library of eligibility criteria	121
6.1	Introduction	122
6.2	Materials and Methods	124
6.2.1	Interpreting eligibility criteria	124
6.2.2	Model of the library	128
6.2.3	Populating the model	128
6.2.4	Visualization	130
6.2.5	Evaluating results	130
6.3	Results	132
6.3.1	Characteristics of the library	132
6.3.2	Querying the library	133
6.3.3	Visualization	135
6.3.4	Evaluation results	137
6.4	Related work	139
6.5	Conclusions	141
7	Conclusions	143
7.1	Results	143
7.2	Relevance	149
7.3	Limitations and future work	149
	Bibliography	153