SATTOSE 2009 - Tracks for restructuring models

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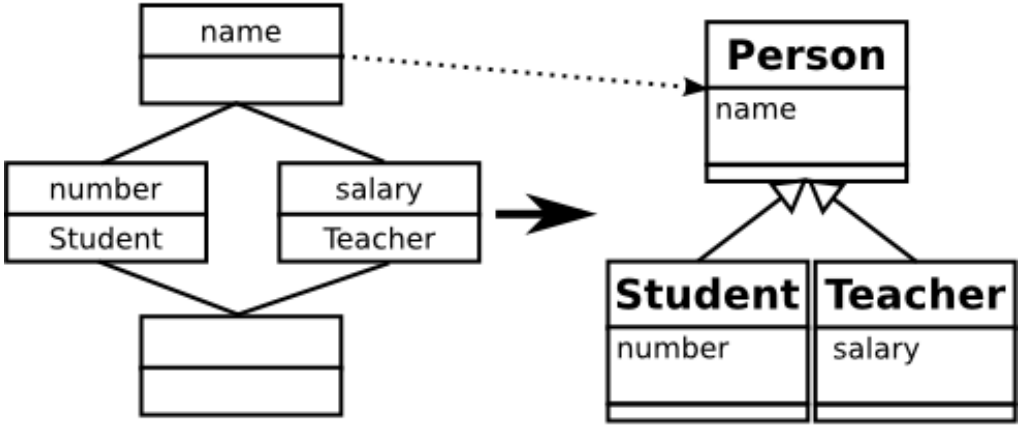
Topics

- Formal Concept Analysis, theory extensions, algorithms, applications to SE and ontologies
- Model restructuring, matching and transformation
- Component and service based software : catalogues, substitution

Restructuring models - mining abstractions

Formal Concept Analysis (Ganter, Wille, 1999)

- A clustering method for *flat* data
- Removes *first-level* duplications
- Systematically highlights missing abstractions
- Ensure semantics of generalization links



Formal concept analysis / Galois lattices

[Birkhoff 1940, Barbut et Monjardet 1970, Wille 1982]

Données

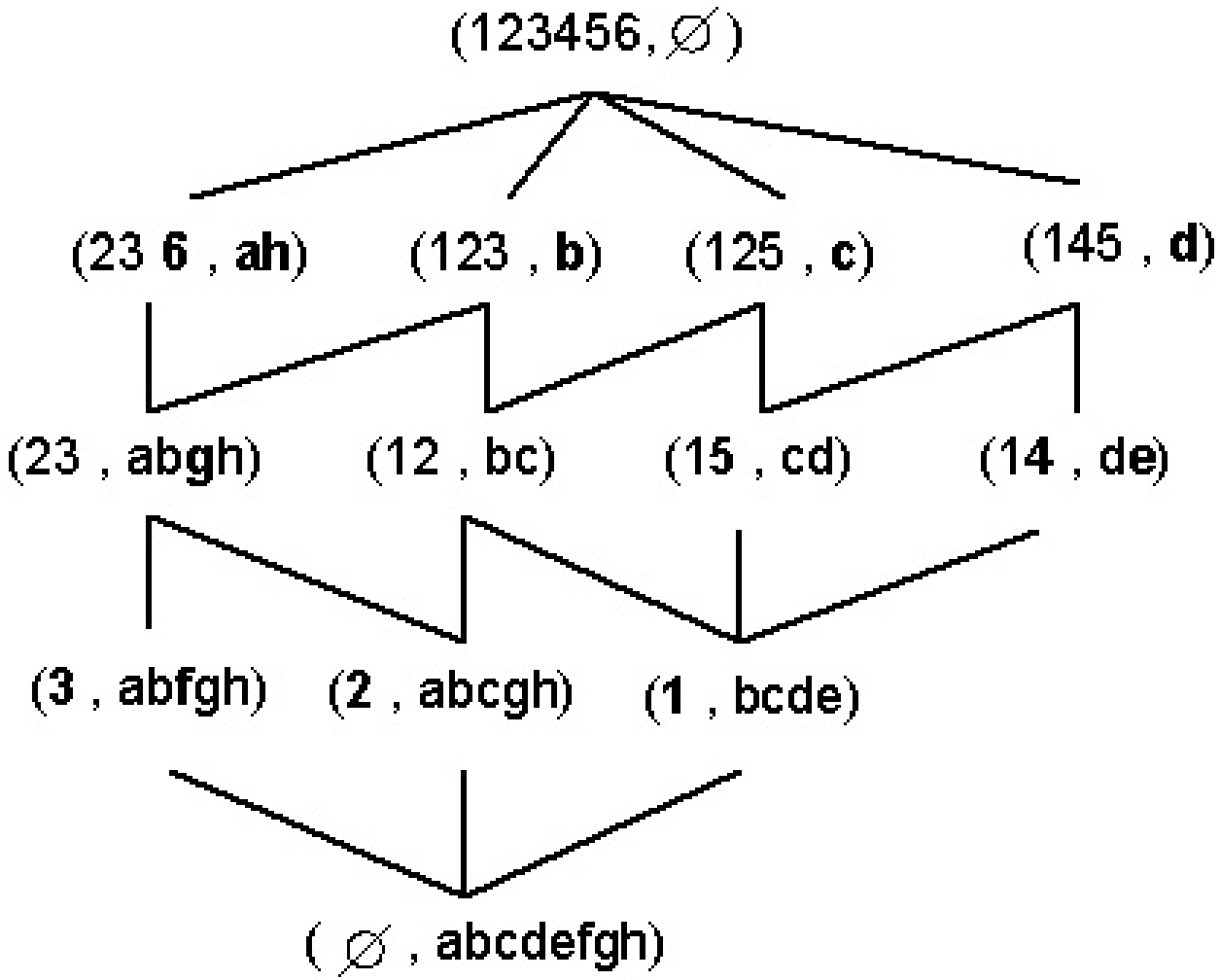
	a	b	c	d	e	f	g	h
1		×	×	×	×			
2	×	×	×				×	×
3	×	×				×	×	×
4				×	×			
5			×	×				
6	×							×

Concept (E, I) - Example $(\{1,2\},\{b,c\})$

- E, Extent - covered objects $\{1,2\}$
- I, Intent - shared properties $\{b,c\}$

Concept lattices

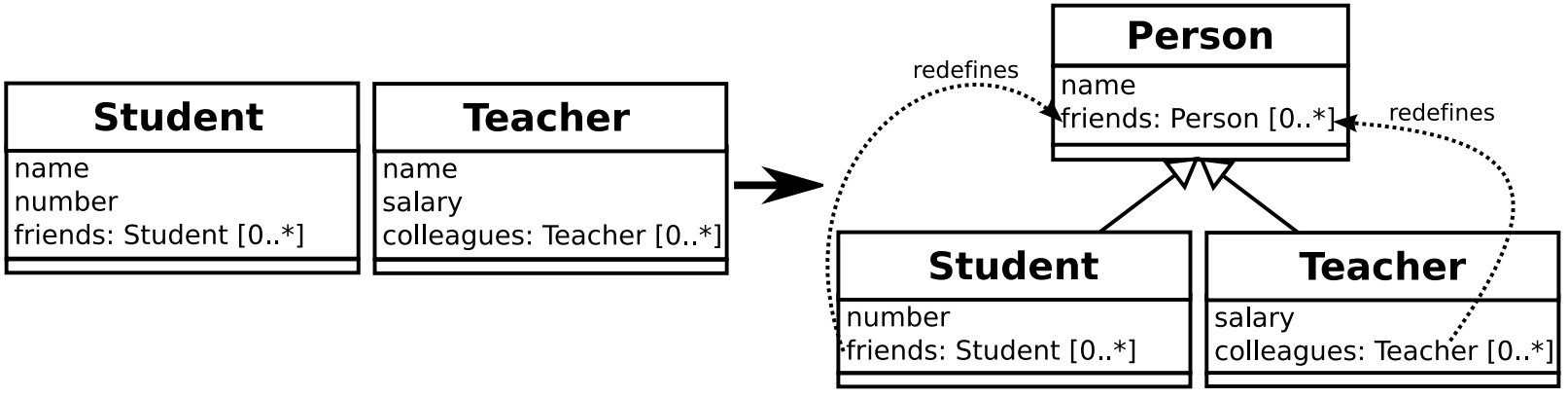
Organization by specialization



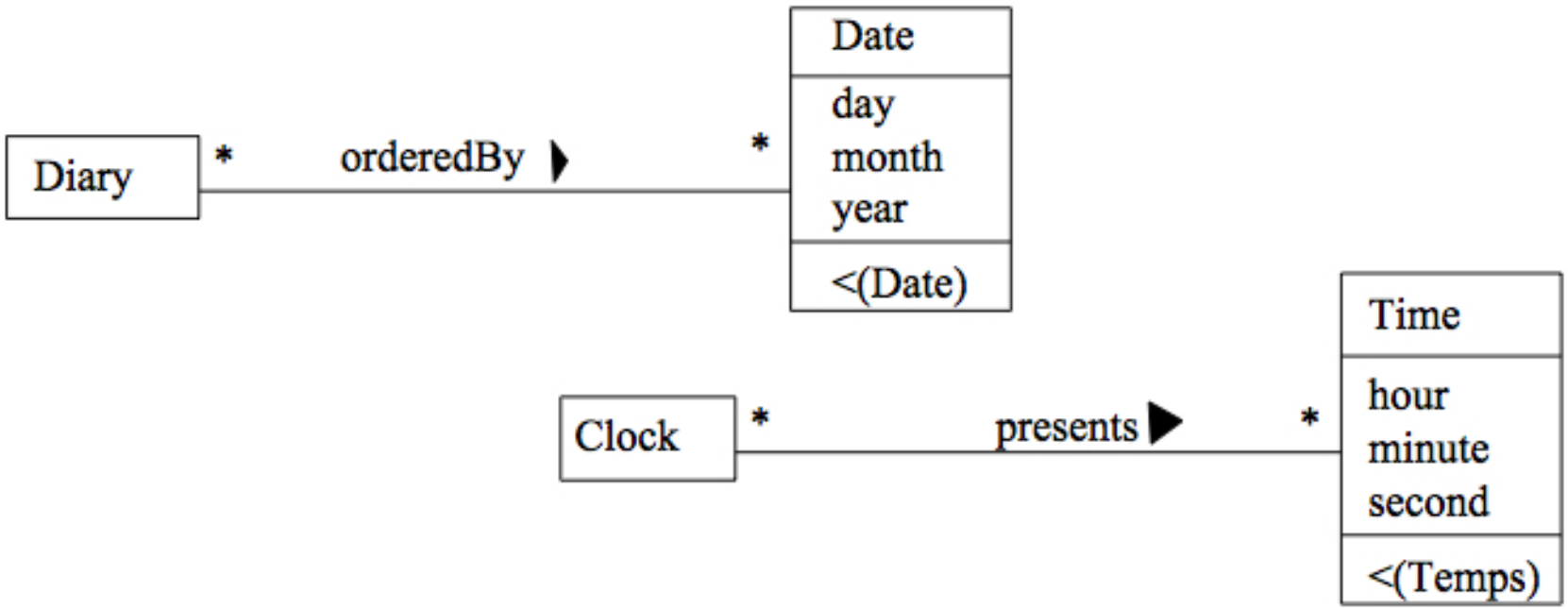
Restructuring models - mining abstractions

Relational Concept Analysis (Huchard, Rouane, Roume, Valtchev 2003)

- A clustering method for *relational* data
- Removes *recursively hidden* duplications
- Systematically & *iteratively* highlights missing abstractions
- Ensure semantics of generalization links between *several entity kinds*
- *model normalization*



Diary et Clocks : mining hidden abstractions



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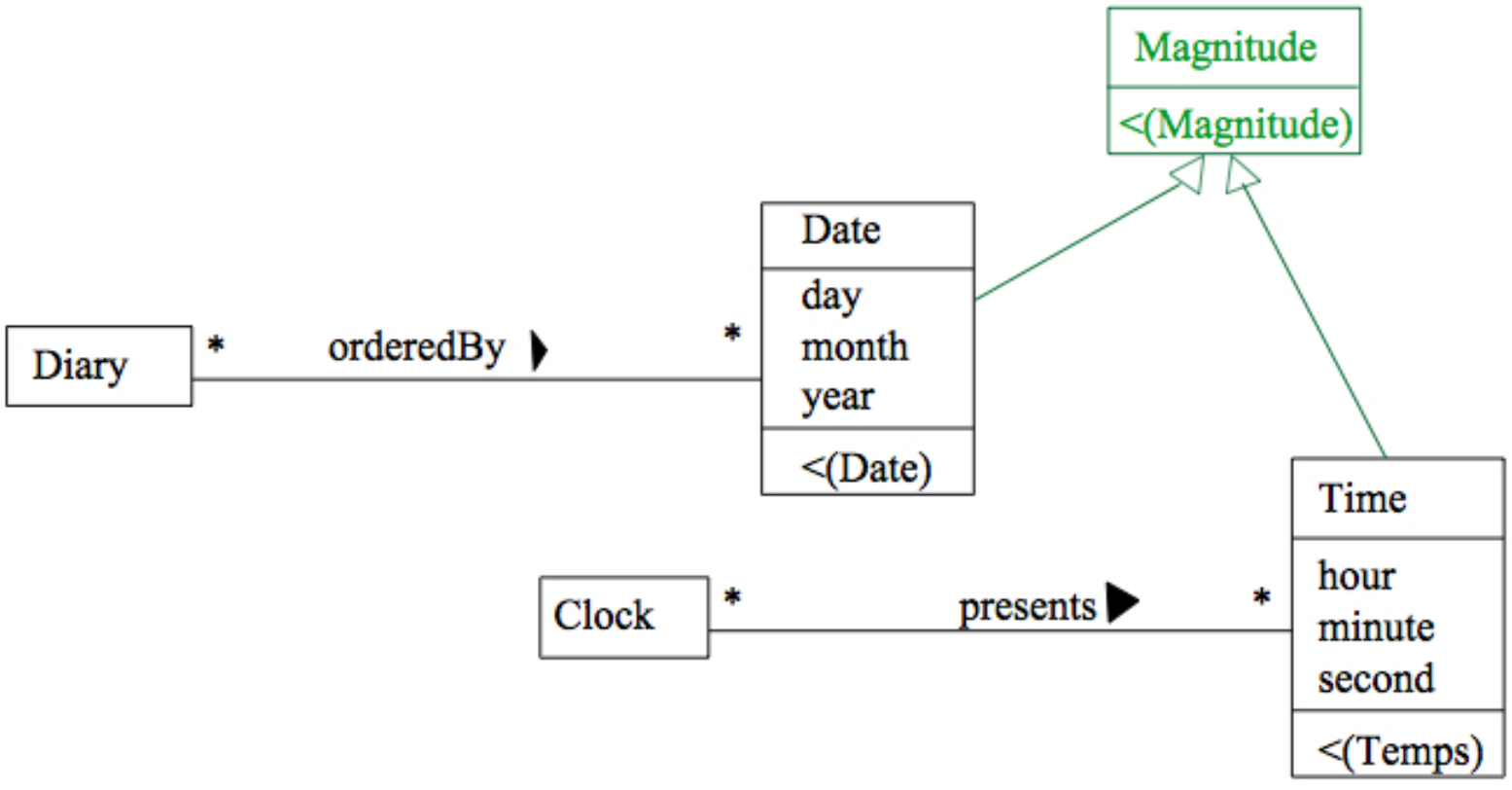

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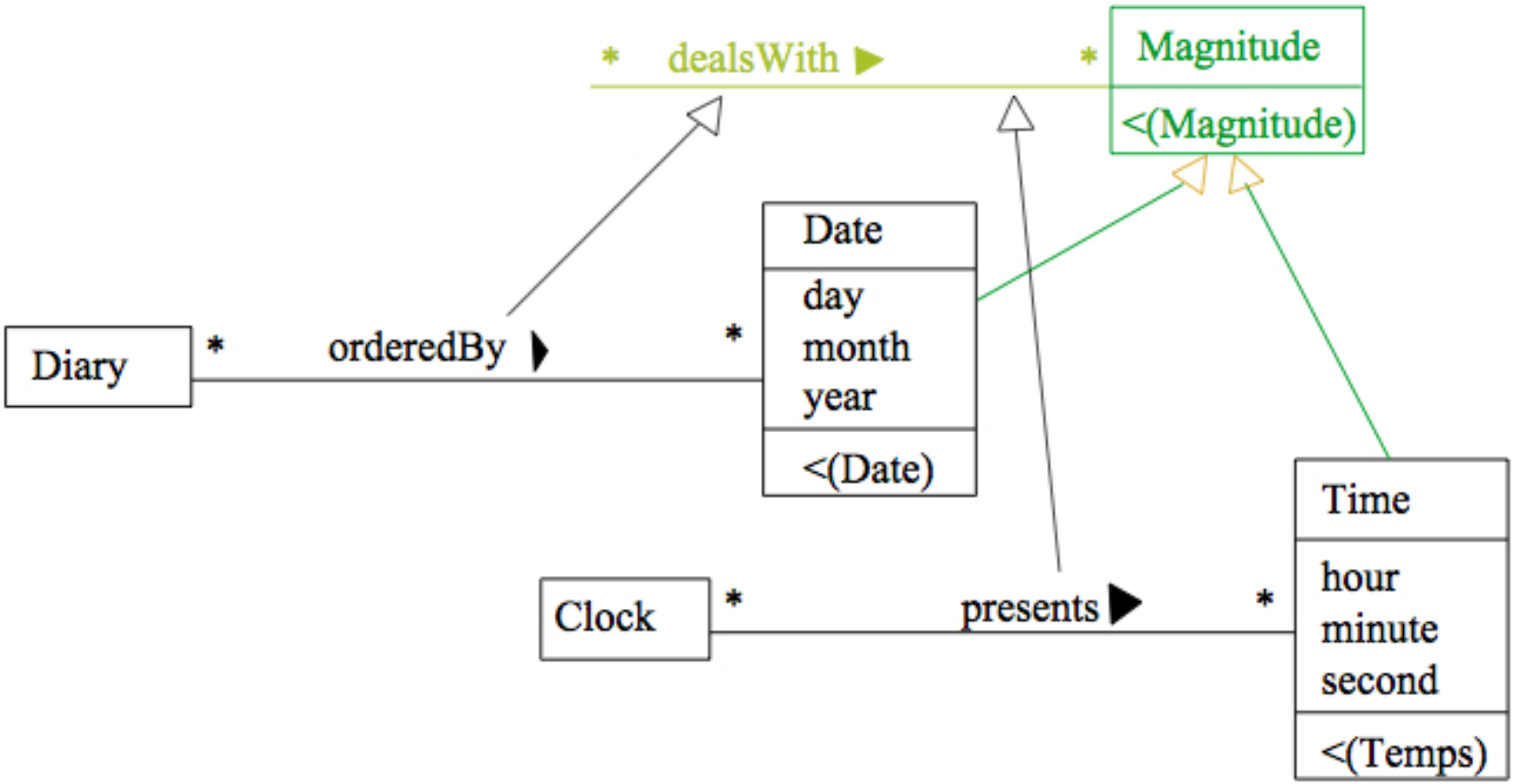
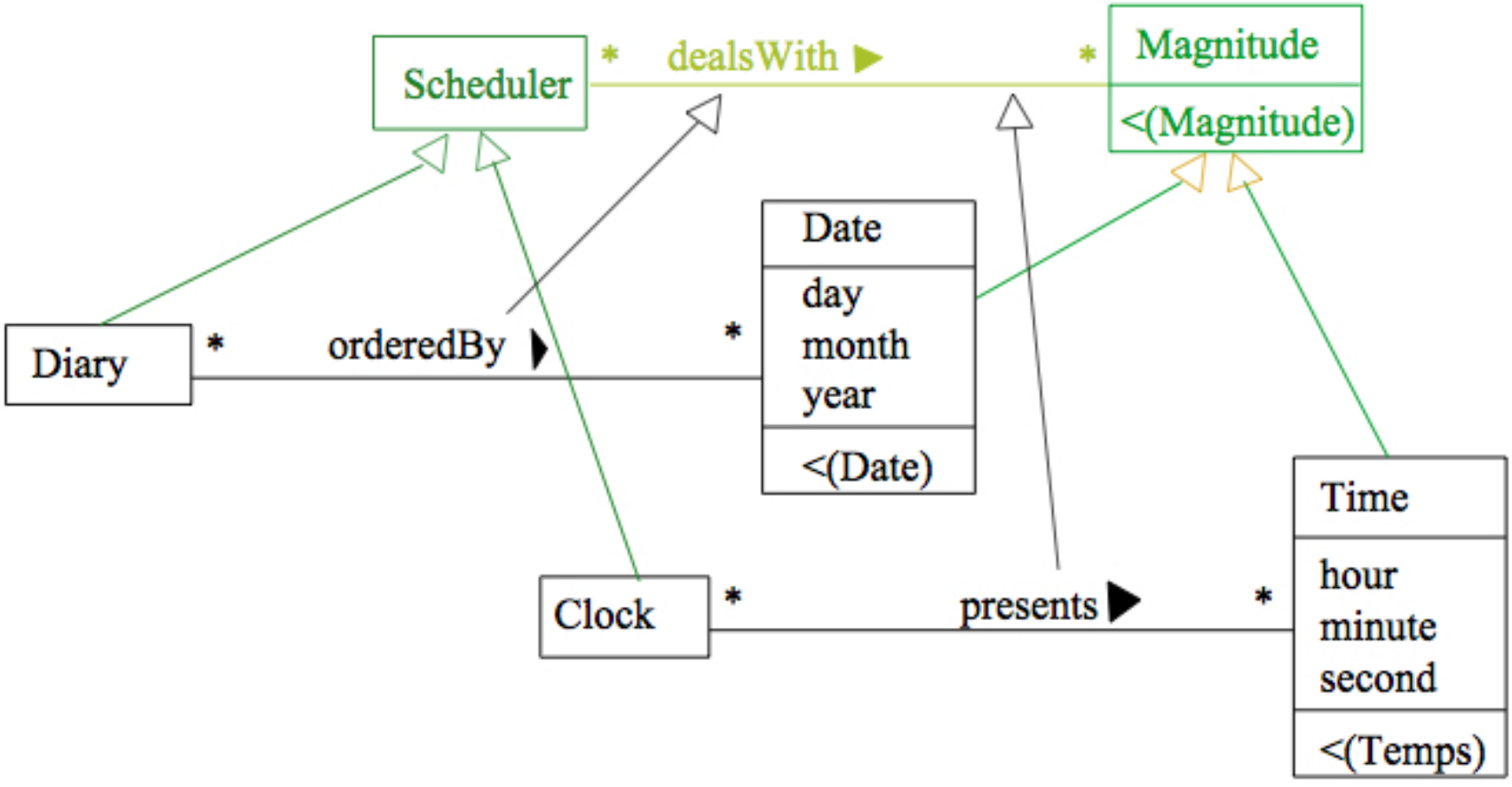


Diary et Clocks : mining hidden abstractions



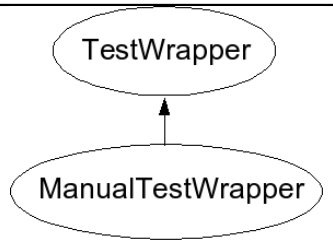
Proposal, limits and tracks of research

- Generic MDE approach (G. Arevalo, J. R. Falleri, C. Nebut)
- Experiments on Orange Labs and open source projects
- A combinatorial technique
- Filtering data before and after construction
- Mix structural and semantical approach : linguistic analysis
- Concentrate on points of interest : looking for similarities

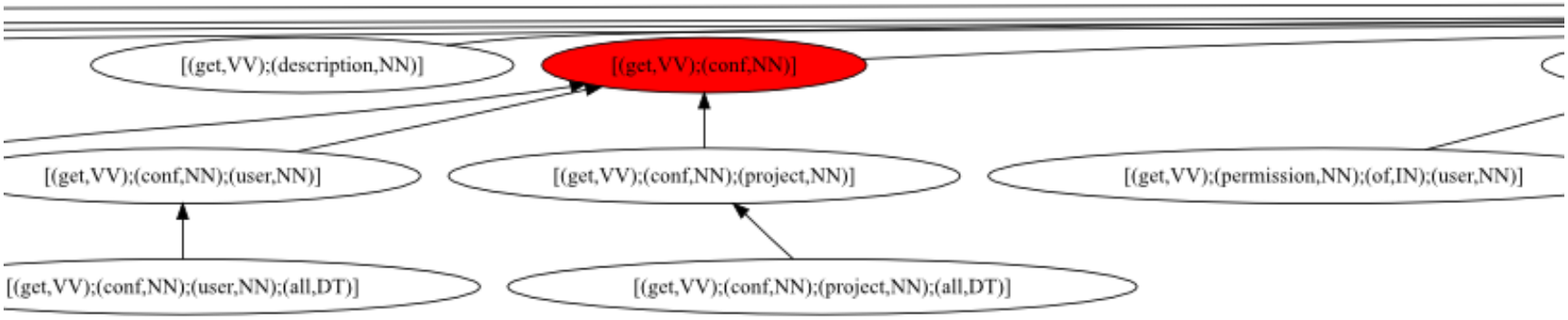
About linguistic problems and identifier analysis

[J.-R. Falleri, M. Dao, M. Lafourcade, C. Nebut, V. Prince]

- Identification of potential abstractions based on names
- Synonymy, hyperonymy, hyponymy, cohyponymy can lead the process

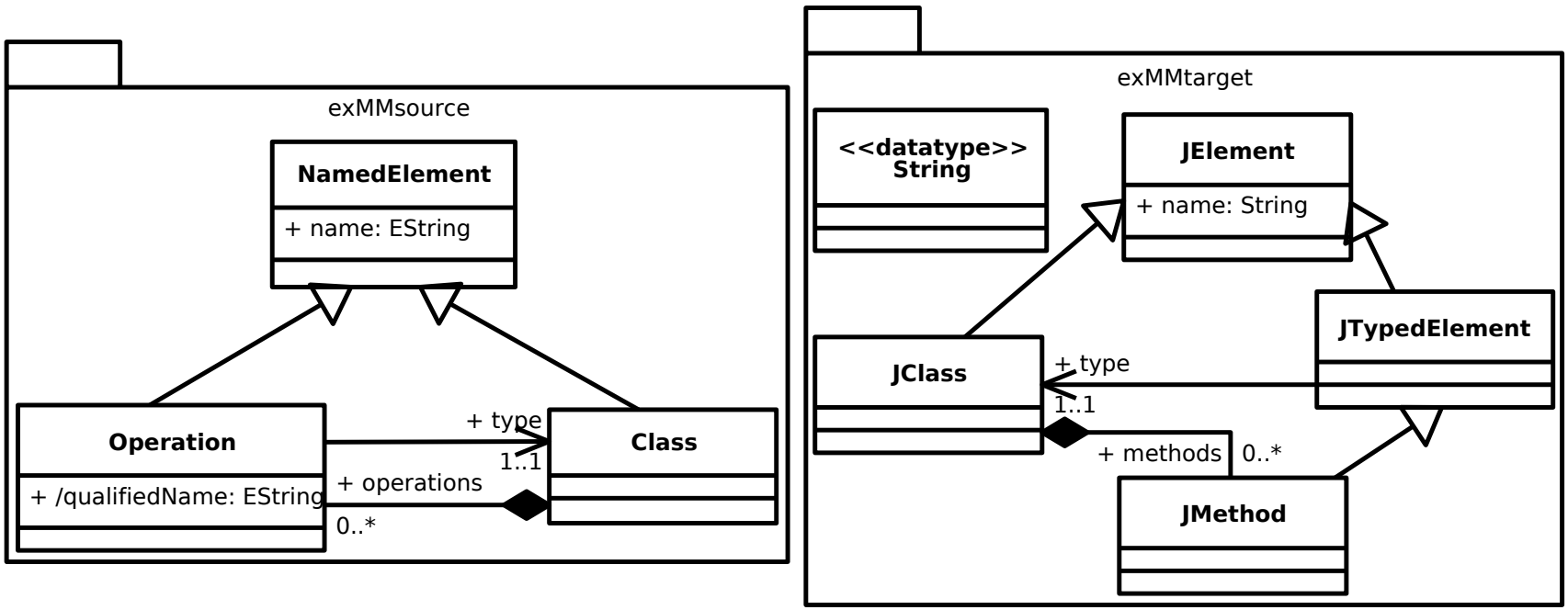
Step	`TestWrapper`	`ManualTestWrapper`
Segmentation	(Test, Wrapper)	(Manual, Test, Wrapper)
Part-of-speech classif..	(Test NN, Wrapper NN)	(Manual JJ, Test NN, Wrapper NN)
Dependency analysis	(Wrapper NN, Test NN)	(Wrapper NN, Test NN, Manual JJ)
Lexical relation	HYPER(`TestWrapper`,`ManualTestWrapper`)	
Lexical view		

About linguistic problems - Lexical views



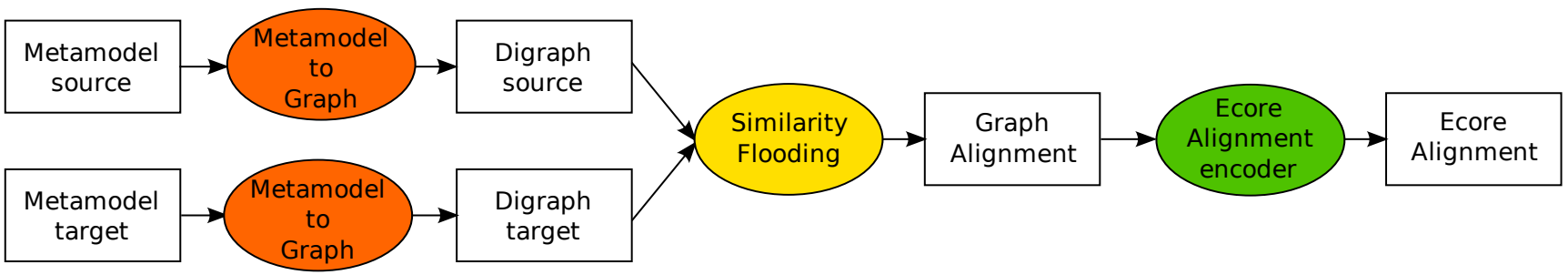
About model alignment

Input models



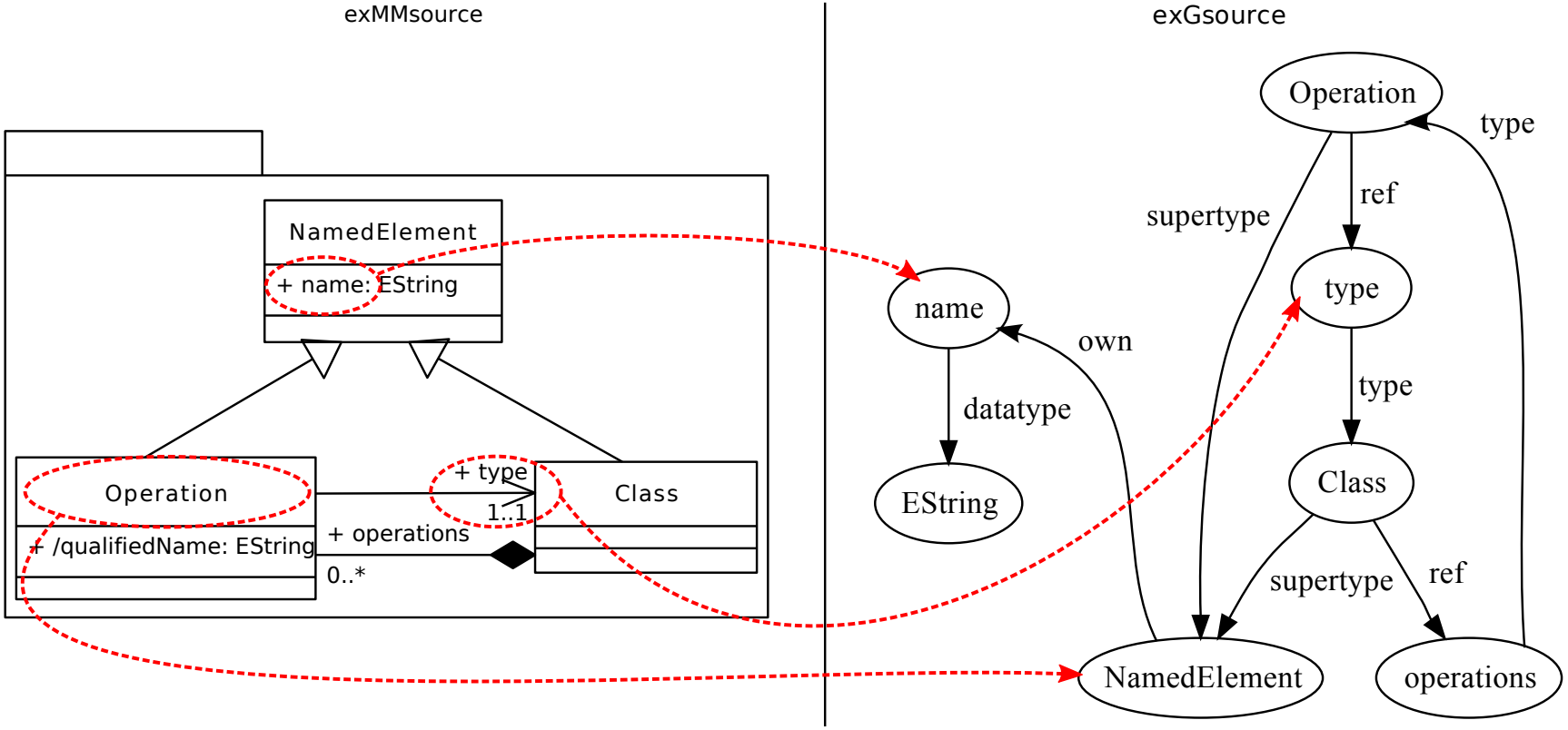
About model alignment

- Similarity flooding [Melnik et al.]
- Applied to meta-model matching [J.-R. Falleri, M. Dao, M. Lafourcade, C. Nebut, V. Prince]
- Used for detecting similarities : an other application is generating transformation rules



About model alignment

Similarity flooding [Melnik et al.]



About model alignment

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