Legal RuleML Tutorial
Use Case - LegalRuleML for Legal Reasoning in Patent Law

IES Fact Screening and Transformation Project (FSTP)

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RuleML 2013, 11-13. July 2013, Seattle, USA
Innovation Expert System
Fact Screening and Transformation Project

Objectives

► Transforming technical facts into all available formal technical indications, to quantify the innovation’s “creativity” (creative thoughts) over prior art.

► Building (semantic) interrelations between the identified technical facts to its external contexts (law/precedents/skill/…).

► Answering queries concerning these technical indications and their dependencies on its fundamental disclosures and concerning compliance with respect to the applicable patent law system.
Overall View

Markup

Formalization

Decomposition

Interpretation

Justification

**doc.0 (Patent)**

TT.0 (Technical Teaching)

- MUI.0-items

- Extract AD Elements
- Extract AD Predicates

- BID Concepts
  - (Mirror predicates)

- SoDis (Elements)
- SoDis (BID Concepts)

- SoJ (SoDis (Elements))
- SoJ (SoDis (BID Concepts))

**doc.CT (Patent Context)**

- Law / Precedents
- Examination
- Skills + Posc

- §102/§103 Justifications
- §112 Justifications
- §101 Justifications
Example: Inventive Concept Tests
Example: 35 U.S.C. §112, 6th paragraph

"An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof."

MPEP 2181 Identifies A Three Prong Test To Be Applied:

- (A) the claim limitations must use the phrase "means for" or "step for;"
- (B) the "means for" or "step for" must be modified by functional language; and
- (C) the phrase "means for" or "step for" must not be modified by sufficient structure, material or acts for achieving the specified function.
Landmark Decisions - Example


Decision re-explained the norms within the 6th Para of § 112 (35 U.S.C Patent Law).

**Lighting Ballast Control LLC v. Philips Electronics North America Corp & Universal Lighting Technologies**
*(Fed. Cir. January 02, 2013)*


The presumption triggered by use of the word “means” may be rebutted if the claim itself recites sufficient structure for performing the function. By contrast, when a term only indicates what the recited means “does, not what it is structurally,” the claim is properly construed under § 112, ¶ 6. For example, *Bionedica, LLC v. Waters Techs. Corp.*, 490 F.3d 946, 949 (Fed. Cir. 2007). we construed the phrase “control means for automatically operating said valving,” 490 F.3d at 949. We held that the term “control” Lighting Ballast points to case law in which this Court declined to apply means-plus-function claiming in view of expert testimony and other extrinsic evidence showing that certain claimed elements implied sufficient structure. In those cases, however, ...at means-plus-function claiming did not apply because the claim limitations at issue did not include the word “means.” See *MTT v. Abacus Software, 462 F.3d 1344, 1353 (Fed. Cir. 2006) Greenberg v. Ethicon Endo-Surgery, Inc.*, 91 F.3d 1580, 1583 (Fed. Cir. 1996) (construing the term “detent mechanism”; “means” did not appear in the claim). In this case, we start with the presumption that means-plus-function claiming does...........the claim limitation includes the word “means.” ULT failed to ....... evidence to overcome that presumption.

35 U.S.C. §112 6th paragraph
Knowledge Representation

Patent law and precedents (or portions) are represented as workflow models, which are then modeled using LegalRuleML and Reaction RuleML.
Example: New AIA: First-Inventor-to-File

- With the America Invents Act (AIA) 35 U.S.C §102(a)-(g) is replaced by new 35 U.S.C. §102 (a)-(d): change of First-to-Invent to a First-Inventor-to-File system
- Effective date 16th of March 2013
Example: Temporal Management in Legal RuleML

Legal Text @35USC §102 (a)-(g)

Legal Text @35USC §102 (a)-(d)

Legal Ontology Concepts @V1

Legal Ontology Concepts @V2

Legal Rules@ original

Legal Rules@ Enactment

Legal Rules@ Efficacy

Metadata-0/0/0

Metadata-9/16/11

Metadata-3/16/13
Example:
Time information in Legal RuleML

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<lrml:TimeInstants>
  <ruleml:Time key="#t2">
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  </ruleml:Time>
  <ruleml:Time key="#t1">
    <ruleml:Data xsi:type="xs:date">2013-03-16</ruleml:Data>
  </ruleml:Time>
</lrml:TimeInstants>

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  <lrml:TemporalCharacteristic key="e2">
    <lrml:forRuleStatus iri="&lrmlv;#Efficacious"/>
    <lrml:hasStatusDevelopment iri="&lrmlv;#Starts"/>
    <lrml:atTimeInstant keyref="#t2"/>
  </lrml:TemporalCharacteristic>
  ...
</lrml:TemporalCharacteristics>

<lrml:RuleContext key="ruleInfo1" hasCreationDate="#tc1">
  <lrml:appliesTemporalCharacteristics keyref="#tblock1"/>
  ...
</lrml:RuleContext>
```
Each decision point in the workflow are modeled using ReactionRuleML (+ semantic interfaces)
Different semantic data sources supporting:
- Processing of NLP-Tests considering the specifically juristic language
- Annotation of syntactic structures with a semantic meaning
- Matching of structures using background knowledge

Semantic enrichment of justifications with legal background knowledge

Transformation of the formal representation into a human understandable format
Semantic Linked Open Data Cloud

Skills

Standards

Prior Art

Interlinked semantic background knowledge on the Web used for the patents’ external contexts
About: United States patent case law
An Entity of Type: Concept, from Named Graph: http://dbpedia.org, within Data Space: dbpedia.org

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About: http://dbpedia.org/resource/Phillips_v_AHW_Corp.
An Entity of Type: Thing, from Named Graph: http://dbpedia.org, within Data Space: dbpedia.org

Phillips v. AHW Corp., 415 F.3d 1303 (Fed. Cir. 2005), was a case decided by the Federal Circuit that clarified the hierarchy of evidentiary sources usable for claim construction in patent law.

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<td>Phillips v. AHW Corp., 415 F.3d 1303 (Fed. Cir. 2005), was a case decided by the Federal Circuit that clarified the hierarchy of evidentiary sources usable for claim construction in patent law</td>
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<td>The most important source in the evidentiary hierarchy of claim construction is the ordinary meaning of the language of the claims themselves and other intrinsic sources like the prosecution history. Extrinsic evidence like dictionaries and expert testimony are of secondary importance.</td>
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</tr>
</tbody>
</table>
Example: RuleML Typed Logic

- Types can be assigned to terms using the type attribute

```xml
<Var type="dbpedia:Machine_(patent)">Invention</Var>
<Var type="dbpedia:Composition_of_matter">Invention</Var>
```

About: Composition of matter
An Entity of Type: Thing, from Named Graph: http://live.dbpedia.org, within Data Space: live.dbpedia.org

About: Machine (patent)
An Entity of Type: Thing, from Named Graph: http://dbpedia.org, within Data Space: dbpedia.org

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<td>In United States patent law, a machine is one of the four principal categories of things that may be patented. The other three are a process (also termed a method), an article of manufacture (also termed a manufacture), and a composition of matter. In United States patent law, that same terminology has been in use since the first patent act in 1790 (with the exception that processes were formerly termed &quot;arts&quot;). In In re Nutjen, 609 F.3d 1346 (Fed. Cir. 2010), the United States Court of Appeals for the Federal Circuit said: The Supreme Court has defined the term &quot;machine&quot; as &quot;a concrete thing, consisting of parts, or of certain devices and combination of devices . . .&quot; Burks' Duryea, 66 U.S. (1 Wall.) 527, 570 (1863). This includes every mechanical device or combination of mechanical powers and devices to perform some function and produce a certain effect or result. . . . Consequently, it must be added that the parts must interact (usually dynamically) with one another; for otherwise they might be parts of an article of manufacture. It has been considered a ground for rejecting or invalidating a machine claim as being directed to a &quot;mere aggregation&quot; if the parts were merely associated with one another without interacting functionally. An illustration of a mere aggregation would be the &quot;combination&quot; of a bathtub and a pencil sharpener. More recently, the &quot;mere aggregation&quot; ground of invalidity for a machine claim has been subsumed under obviousness. Examples of machines are steam engines, sewing machines, and TV sets. Electronic circuits have usually been considered machines, although they may lack moving parts.</td>
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Summary

• Legal representation format for legal reasoning.
  • To support a semi-automated legal decision support system
  • A platform-independent rule standardization in LegalRuleML and Reaction RuleML XML
    • Support for reusability, life cycle management of the knowledge
  • Transformations into executable representation language and automated execution (Prova rule engine http://prova.ws + ontology reasoner)

• Basis for legal argumentations / justifications
Questions?

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