

Logical Jurisprudence as a fundamental frame of the science of law

Hajime Yoshino

Meiji Gakuin University

hyoshino@ls.meijigakuin.ac.jp

<http://www.meijigakuin.ac.jp/~yoshino>

The purpose, the strategy and the frames of Logical Jurisprudence (LJ)

1. Purpose:
 - to establish a genuine science of law.
 - Philosophy of law as a vanguard of the science
2. Strategy:
 - LJ logically analyzes languages in law to clarify the structure of thoughts in law.
 - LJ tries to analyse and construct its scientific theory of law with minimum simple frames like classical physics did.
3. Three fundamental frames
 1. **Sentence**
 2. **Truth**
 3. **Inference**
4. LJ tries to analyze and construct law with these three frames.

1. Legal sentences (LS)

- Legal sentences are sentences that linguistically represents laws.
- LJ deals with not Legal norms as meanings which do not exist in reality but legal sentences the existence of which can be checked inter-subjectively.
- LJ has analyzes law in the smallest units of legal sentences and constructs the law as logical connections between these smallest units.
- LJ found three types of legal sentences each of which is divided into two types:

1. Legal rule sentences and fact sentences

- They have the following syntactical structures:

- $\forall X(a(X) \leftarrow b(X)) : \forall X(is_concluded(contract(X,A),T) \leftarrow become_effective(acceptance(A,X),T))$
- $b(x1) : become_effective(acceptance(a1,x1),2016_11_22)$

2. Legal elementary sentences and complex sentences

- The former is the smallest element of legal sentences and the latter is a set of legal sentences
- *CISG Article 23: A contract is concluded when an acceptance an offer becomes effective.*
- *CISG: United Nations Conventions on Contracts for the International Sale of Goods*

3. Legal object sentences and meta-sentences

- The former regulates the obligation of peple and the latter regulates legal sentences.
- *“B must pay A the price of \$50,000 to A”*
- *“B must pay the price of \$50,000 to A’ is valid on April 15, 2016.”*

- LJ analyzes and reconstruct law and legal reasoning as the logical combination of these 6 types of legal sentences so that law and legal reasoning can be precisely represented on the computer as they are in fact.

2. Truths in law

- Legal sentence can be said true or false in terms of logic.
- The concept of truth plays a decisive role in law.
- LJ classifies the concept of truth in law into three types of truth: (1) **the truth as fact**, (2) **the truth as validity**, and (3) **the truth as justice**.
- LJ provides the semantical foundation of these interpretation of truth.
- LJ makes notices of the fact that the truth as validity is represented with predicate “valid” or “validity” and that amount of legal rule sentences regulating the validity of legal sentences have been provided in law.
- LJ clarifies the deductive system of law in which it is determined whether given legal (rule) sentences are valid or invalid through the legal meta-inference where legal meta (rule) sentences are applied.
- If it is proven that a given legal sentence is true, people can believe that the state of affairs described by the legal sentence exists in legal world.
- Therefore, It is decisively important that the validity of legal sentences is proven in the legal inference.

3. Inference

- The legal sentence itself is merely an array of symbols.
- The meaning of a legal sentence only becomes visible when people use it. In other words, **the legal inference activates LSs as living legal norms.**
- LJ considers the reasoning of the application of law as **the process of developing legal sentences.**
- The legal reasoning consist of **reasoning of justification** and **reasoning of creation** which are related to each other.

Justification of judgments

(1) Deduction

Rule: $\forall X(a(X) \leftarrow b(X))$

Fact: $b(x1)$

Justified: $a(x1)$

Generation of hypo-facts

(2) Abduction

Rule: $\forall X(a(X) \leftarrow b(X))$

Goal: $a(x1)$

Created: $b(x1)$

Generation of hypo-rules

(3) Induction

Goal: $a(x1)$

Fact: $b(x1)$

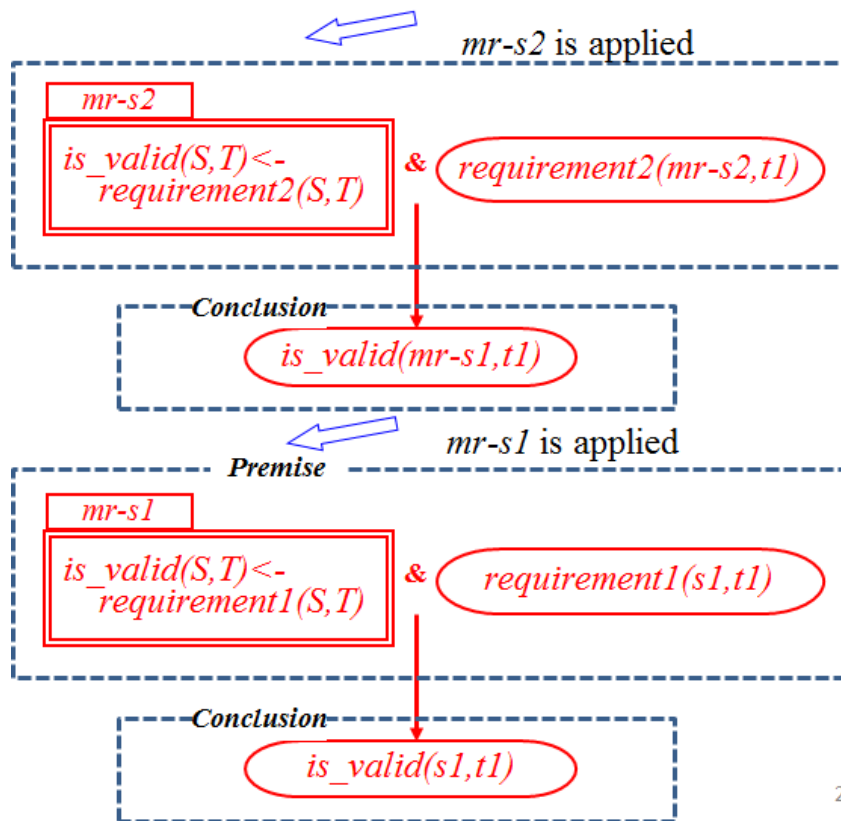
Created: $a(x1) \leftarrow b(x1)$

- The falsification of hypothetical legal sentence:

$$(P \rightarrow Q) \ \& \ \neg Q \Rightarrow \neg P \quad : \quad ((R \ \& \ r1) \ \& \ e1 \Rightarrow c1) \ \& \ \neg c1 \Rightarrow \neg r1$$

An example of legal meta-inference

The logical structure of multi-layered inference



The hierarchy structure of law proving the validity of legal sentences

