

# Learning Legal Principles to Enable Law at Cyber Speeds



Explorations in Cyber International Relations  
Massachusetts Institute of Technology Harvard University

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## Goal: Law at Cyber Speeds

If we are to enable the creation of **Automatic Cyber Targeting Systems** to respond in network time to cyberattacks, we must be able to do legal analyses at network speeds.



## Test Domain: Probable Cause

Example Legal Case:  
US v Mays 466 F.3d 335 (2006)

Police officers conducted two controlled purchases of "crack" cocaine from an address in Shreveport, Louisiana. For the first transaction, a confidential informant allegedly purchased 0.3 grams of "crack" cocaine for \$20 from a black male named "Melvin." For the second transaction, the same informant purchased 0.3 grams of "crack" cocaine for \$20 from a black female whom the informant identified as "Melvin's mother." Officer Bo Lummus of the Shreveport Police Department prepared an affidavit to apply for a search warrant. The magistrate judge found probable cause and issued the warrant.

Police found and seized approximately 25 grams of powder cocaine and 72 grams of "crack" cocaine, as well as firearms, ammunition, a bulletproof vest, three digital scales, and a measuring cup in a duffel bag identified as belonging to Melvin Lee Mays. Mays was arrested. He filed a motion to suppress, alleging that the search warrant was not supported by probable cause. He also filed an objection to the notice filed by the Government alleging two prior felony narcotics convictions and one prior felony conviction for aggravated battery. Mays further filed a motion to sever the felon-in-possession charges from the remaining charges and post-verdict motions for a new trial and judgment of acquittal. Finally, Mays objected to an enhancement in his pre-sentence report based on a narcotics conviction he received when he was 17 years old but tried as an adult.

The district court denied all of Mays's motions and objections. Mays was convicted and sentenced.

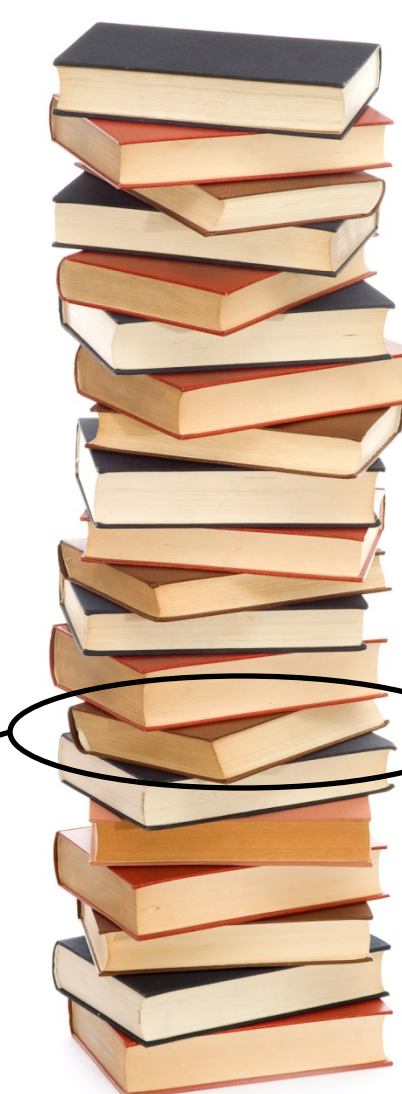
Mays timely appealed.

We affirm the conviction and sentence.

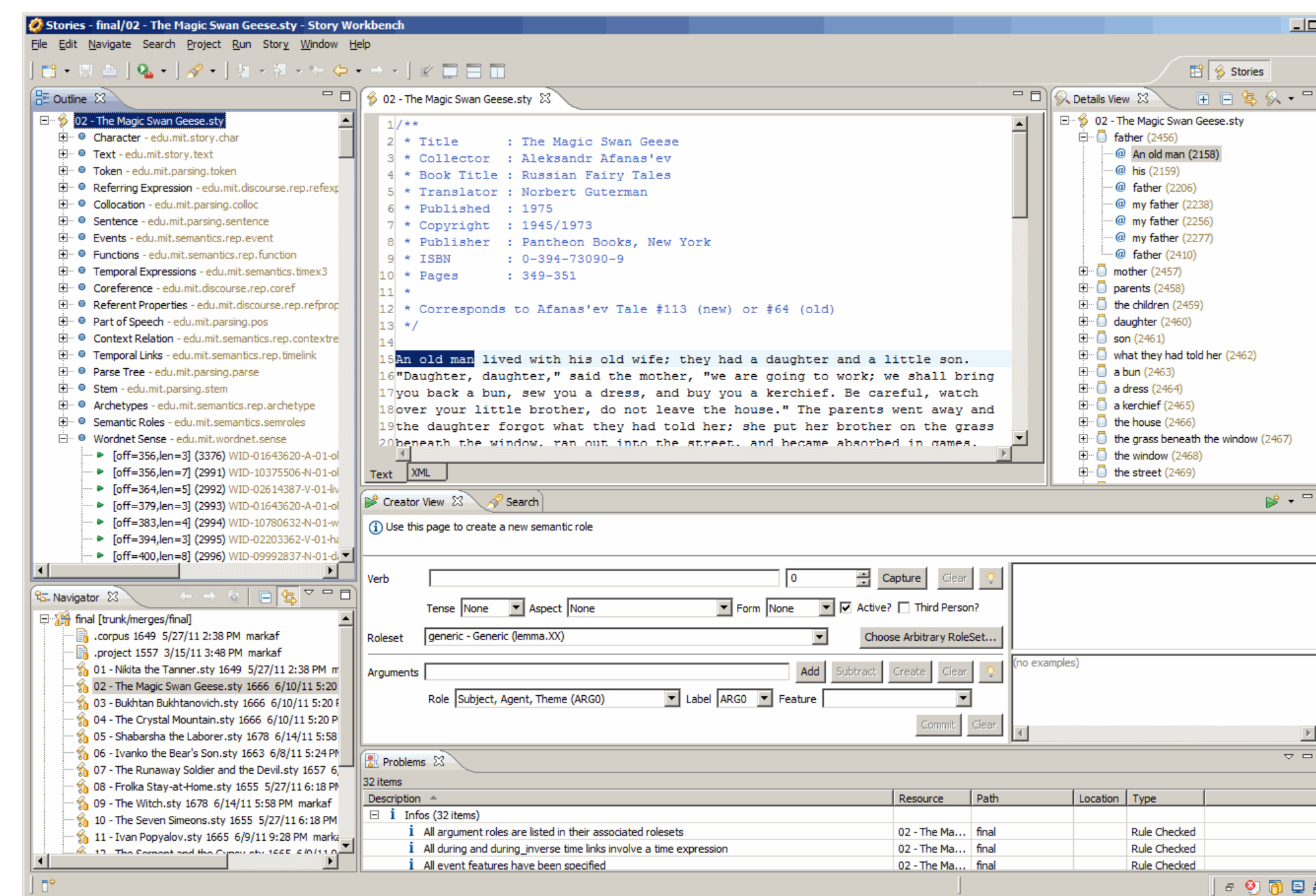
## Problem: Automatically Identifying Legal Principles

Identification of and reasoning from case precedents relies on legal principles; computers currently have no ability to extract legal principles in an automatic and dynamic way.

## Step 1: Assemble Corpus of Appellate Cases

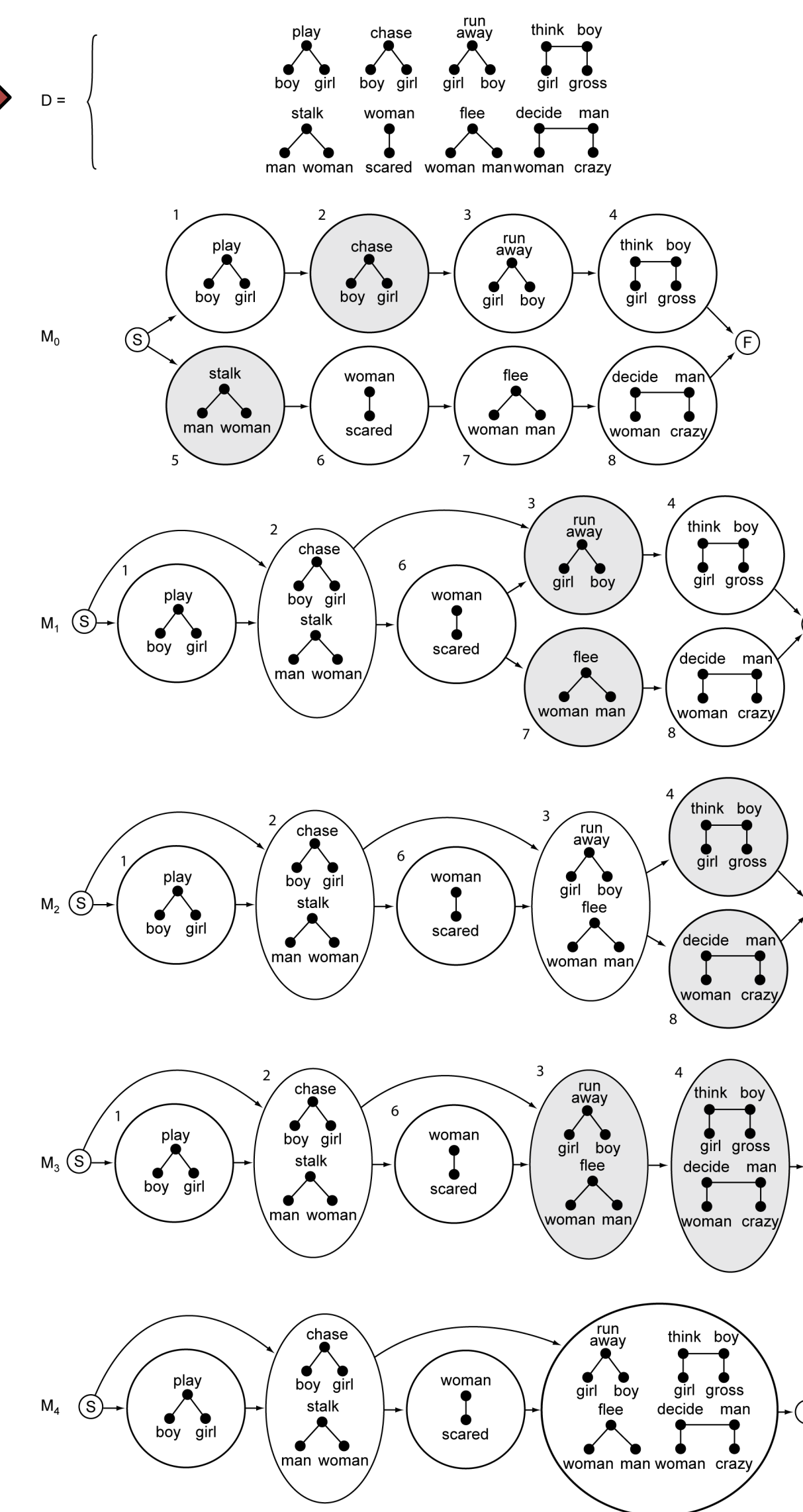


## Step 2: Semantic Annotation (Finlayson 2008, 2011)

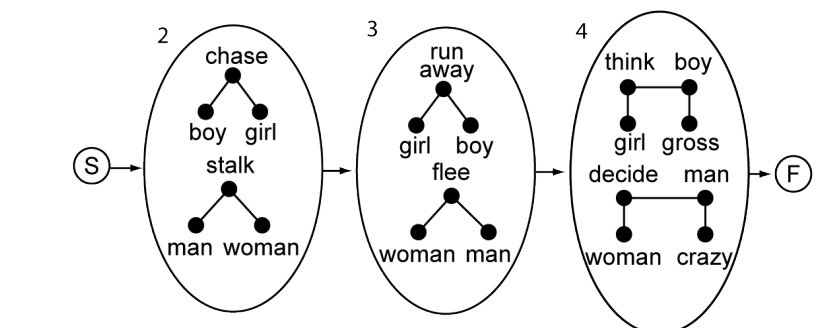


## Step 3: Run Analogical Story Merging (ASM) (Finlayson 2009, 2011)

(1) The boy and girl were playing. He chased her, but she ran away. She thought he was gross.  
(2) The man stalked the woman and scared her. She fled town. She decided he was crazy.



## Result: Extracted Legal Principles



**Evaluation:** Compare with Legal Principles explicitly identified in the case review

## Capabilities Enabled

- Automatic identification of relevant legal precedents
- Automatic discovery of emerging legal frameworks
- Automatic Cyber Targeting systems to respond in network time to cyberattacks



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