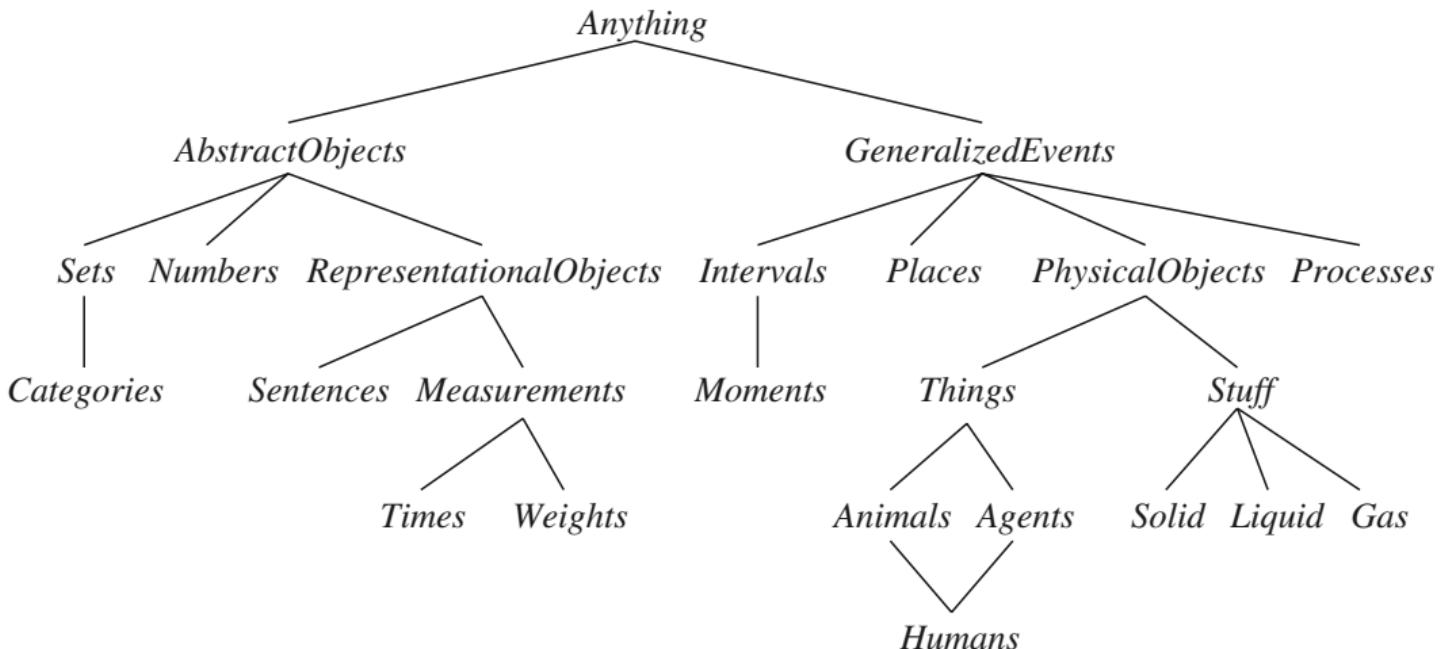


# Artificial Intelligence

## Knowledge Representation

Christopher Simpkins

# Ontological Engineering



# Categories and Objects

Foo

## Events

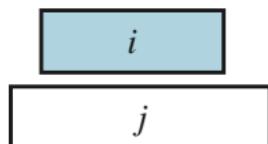
$Meet(i, j)$



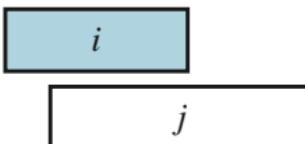
$Before(i, j)$   
 $After(j, i)$



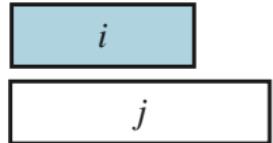
$During(i, j)$



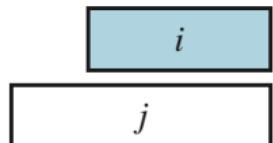
$Overlap(i, j)$



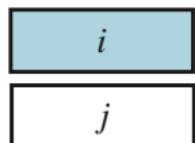
$Starts(i, j)$



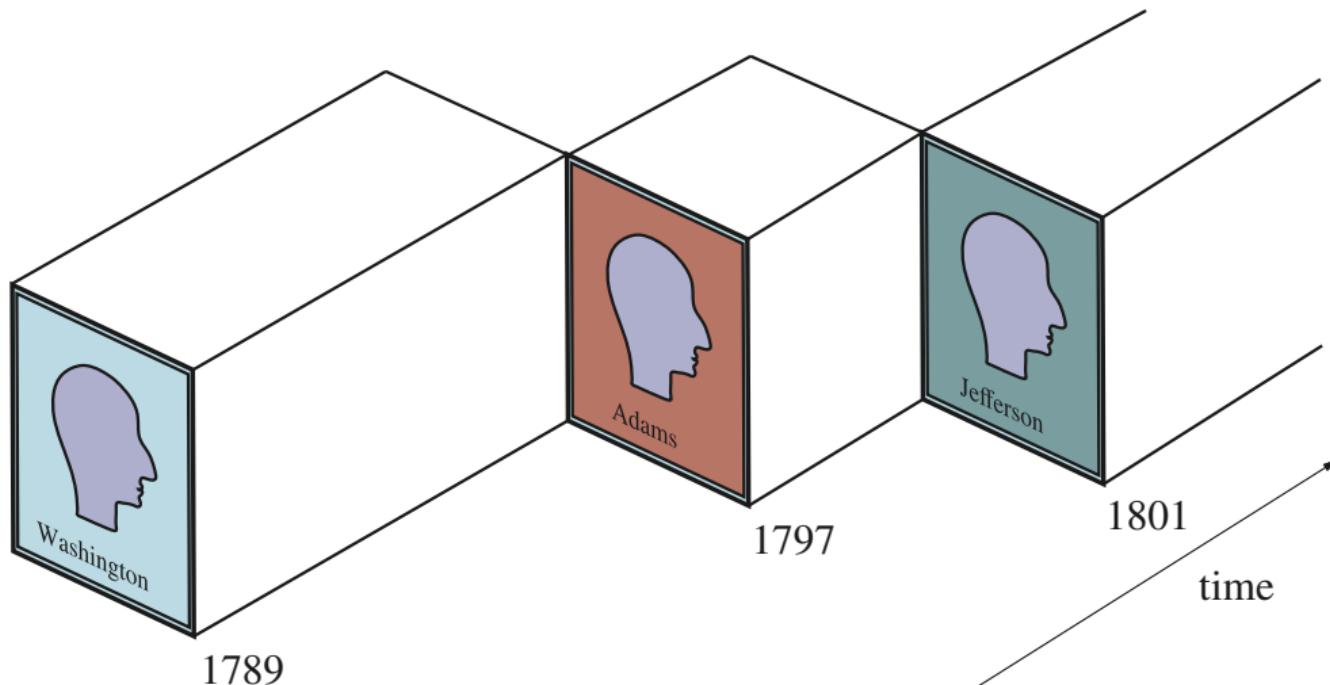
$Finishes(i, j)$



$Equals(i, j)$



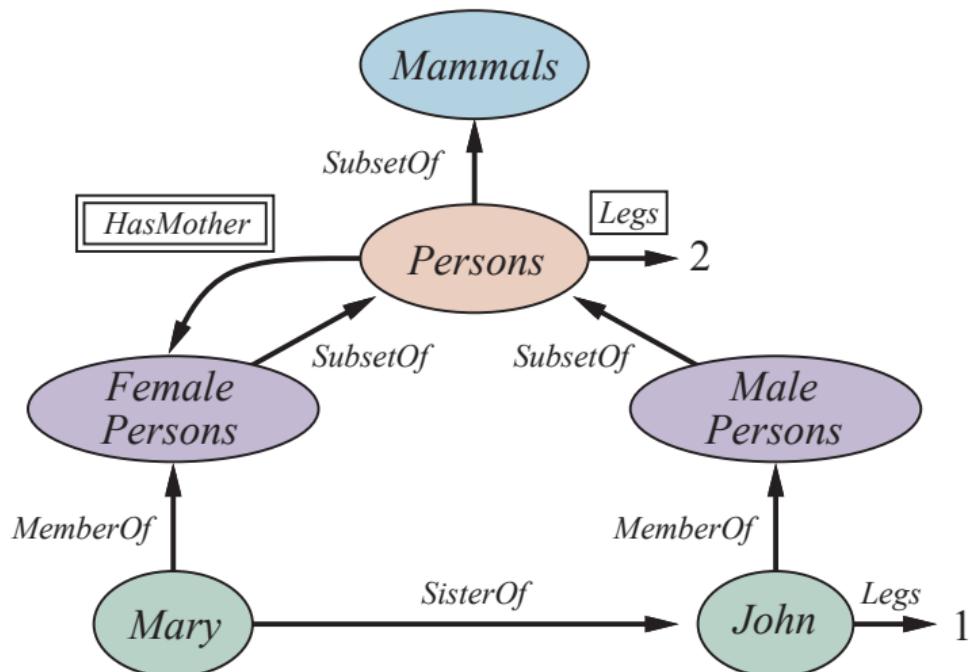
# Fluents



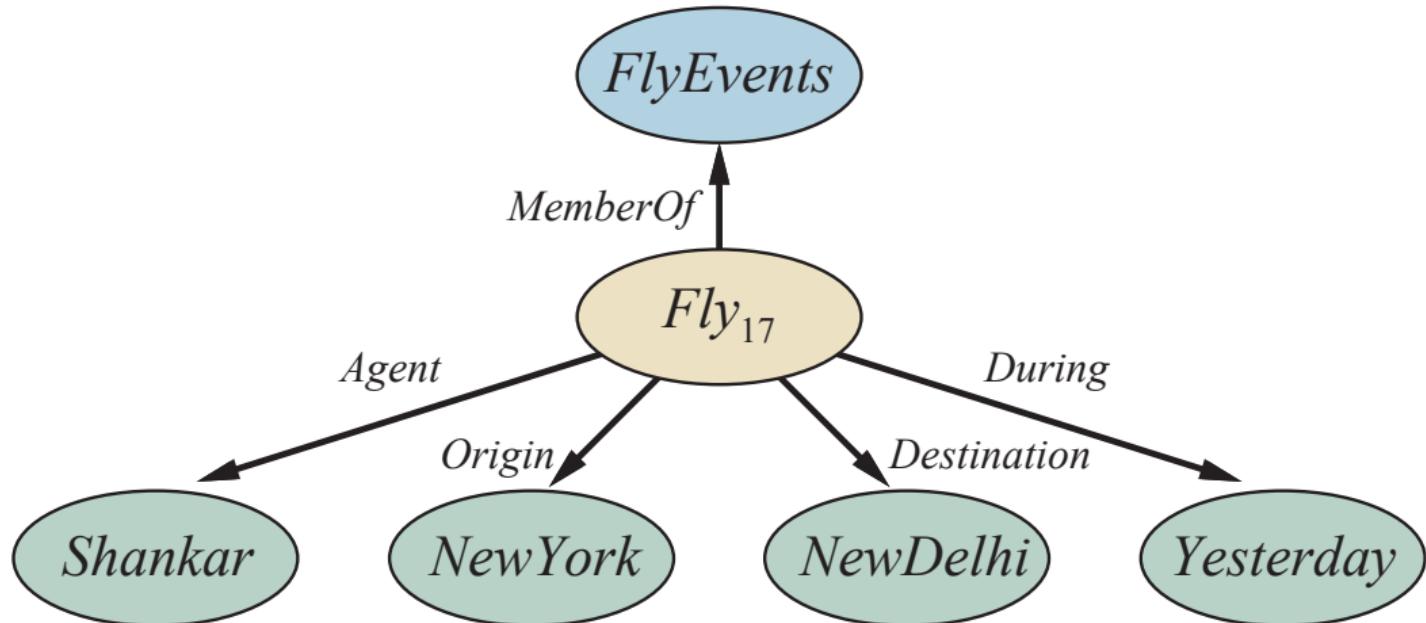
# Mental Objects and Modal Logic

Foo

# Reasoning Systems for Categories



# Reasoning Systems for Categories



# Description Logics

*Concept* → **Thing** | *ConceptName*  
| **And**(*Concept*,...)  
| **All**(*RoleName*, *Concept*)  
| **AtLeast**(*Integer*, *RoleName*)  
| **AtMost**(*Integer*, *RoleName*)  
| **Fills**(*RoleName*, *IndividualName*,...)  
| **SameAs**(*Path*, *Path*)  
| **OneOf**(*IndividualName*,...)

*Path* → [*RoleName*,...]

*ConceptName* → *Adult* | *Female* | *Male* | ...

*RoleName* → *Spouse* | *Daughter* | *Son* | ...

# Reasoning with Default Information

Truth maintenance systems