CCO design patterns

- The following slides contain design patterns for CCO and BFO to be vetted and translated into Mermaid.

- In some cases, big design patterns need to be split into more simple patterns. In other cases, they need to be made more or less general.

- The sources of these design patterns are varied (papers, independent work of researchers, presentations). When possible, provenance of the images is shown. All credits are due to the authors of the respective patterns.

To Do:

- Gather competency questions/use cases (IES, CUBRC (Giacomo), BORO, SOSA, Ryan Cybersecurity (Ryan), etc.)
- Categorize design patterns (Giacomo) (time, space, time+space, roles, dispositions, information,...)
- Homework (Greg and Elena get some first design patterns done)

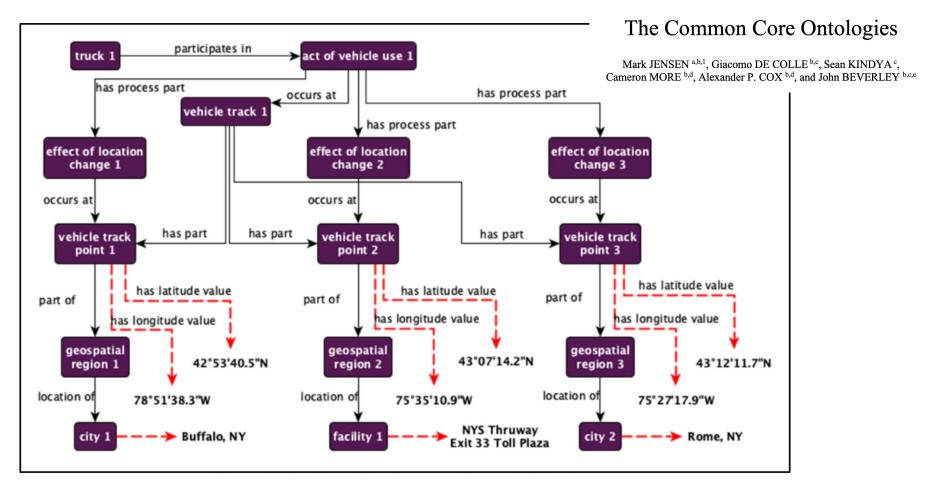


Figure 1: Tracing a Truck across Geospatial Regions

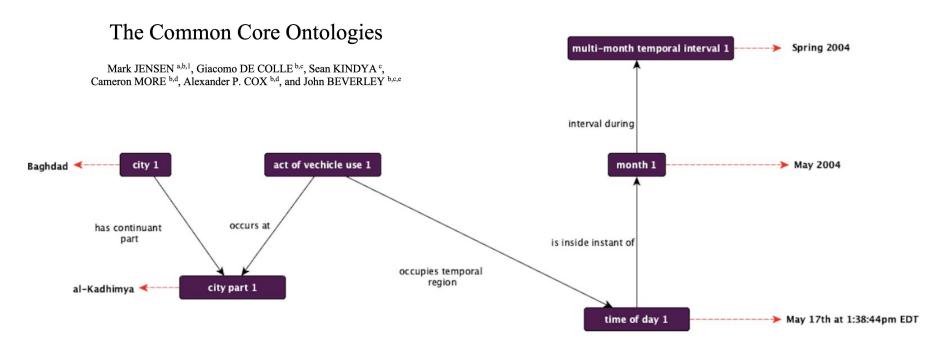


Figure 2: Tracking Processes across Temporal and Spatial Granularities

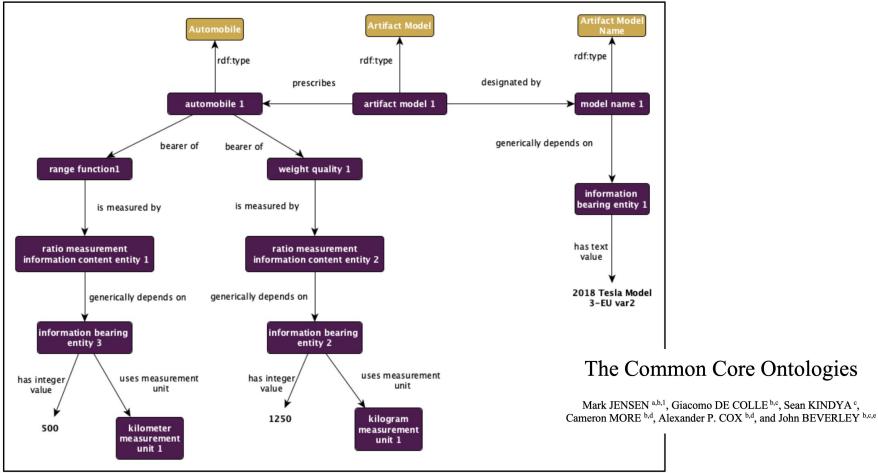


Figure 3: Measuring Outcomes of an Artifact Model Prescription

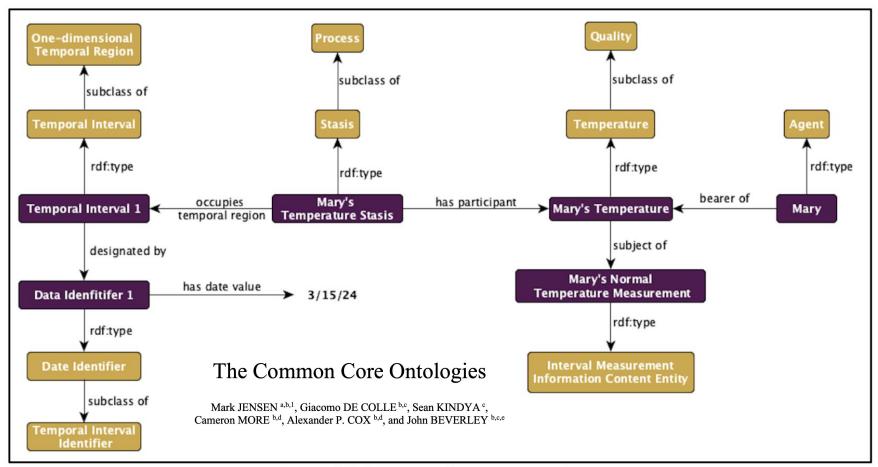


Figure 4: Measuring Constancy over Time

J. Neil Otte 1 , John Beverley 2 , and Alan Ruttenberg 3

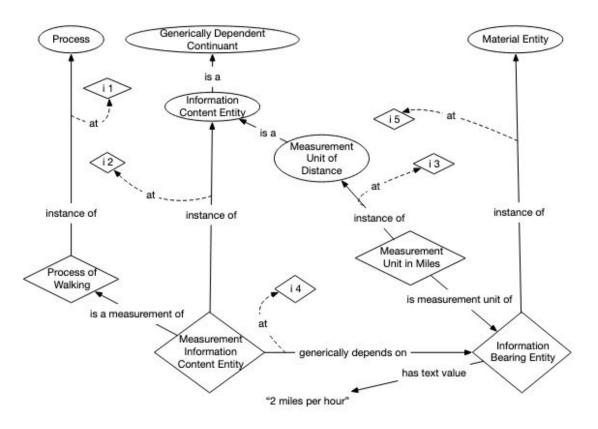


Figure 3: Relationships among Information Content Entities and Bearers

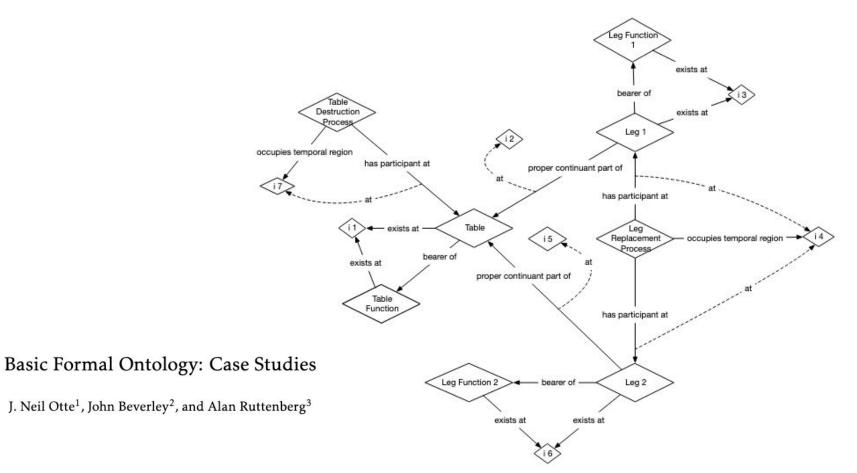


Figure 4: Table Undergoing Change in Case 1

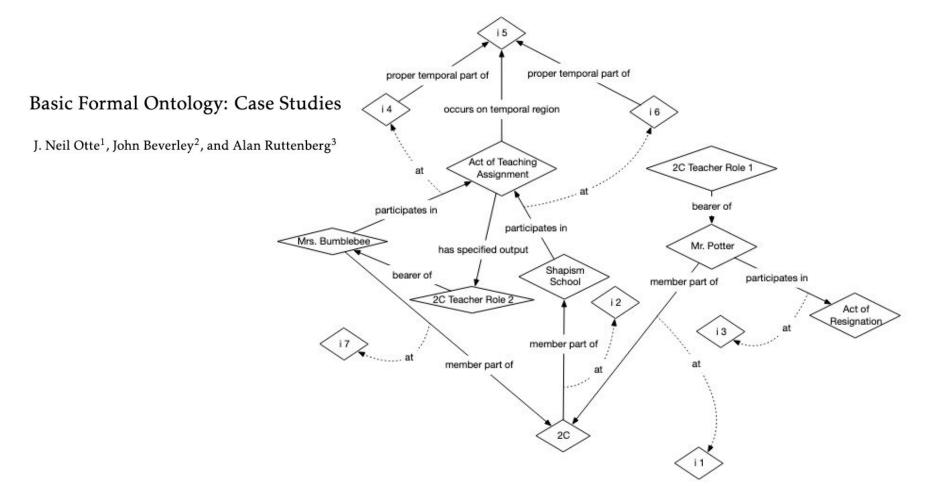


Figure 5: Resignation and Assignment of 2C Teacher Roles in Case 2

J. Neil Otte¹, John Beverley², and Alan Ruttenberg³

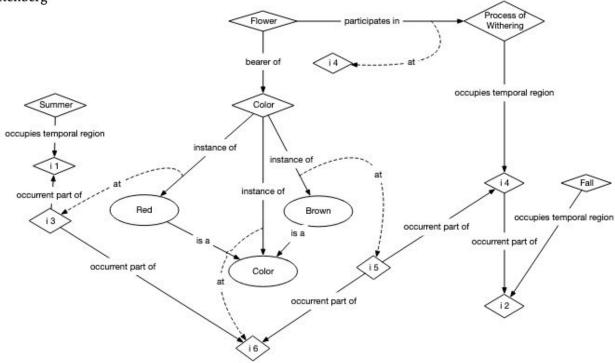


Figure 6: Petal Changing Color in Case 3

J. Neil Otte¹, John Beverley², and Alan Ruttenberg³

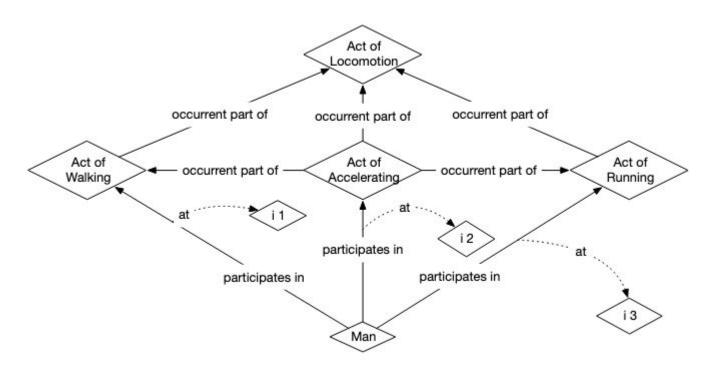


Figure 7: Man Moving with Increasing Speed in Case 4

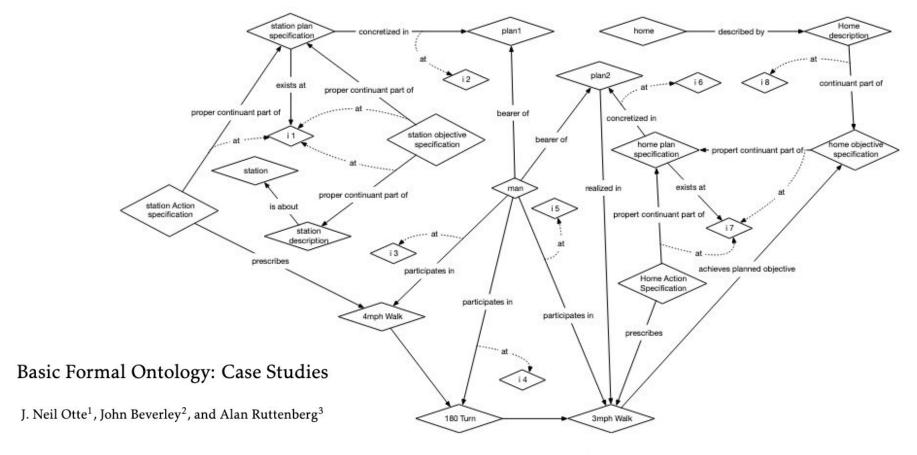


Figure 8: Man Walking to Station, then Home in Case 5

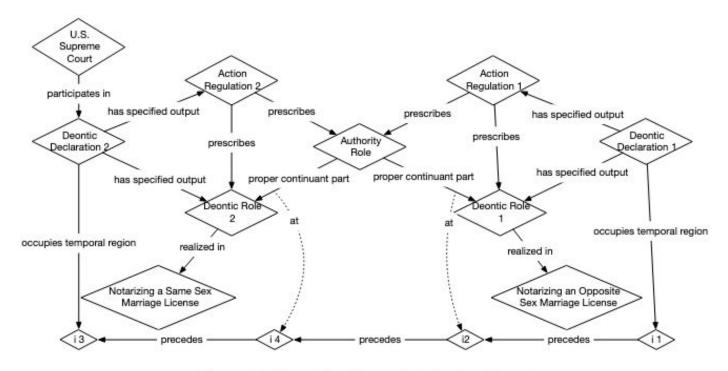
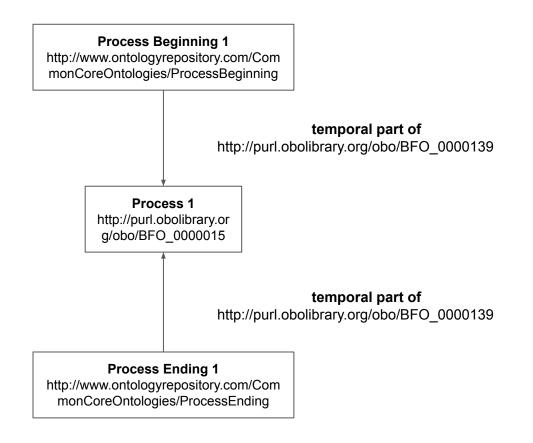


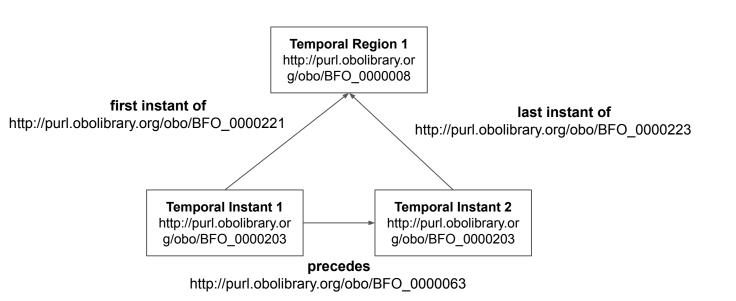
Figure 9: Changing Deontic Roles in Case 6

J. Neil Otte¹, John Beverley², and Alan Ruttenberg³

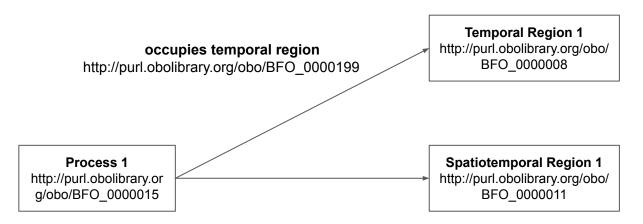
Starting and ending a process



First and Last Moments of Temporal Regions

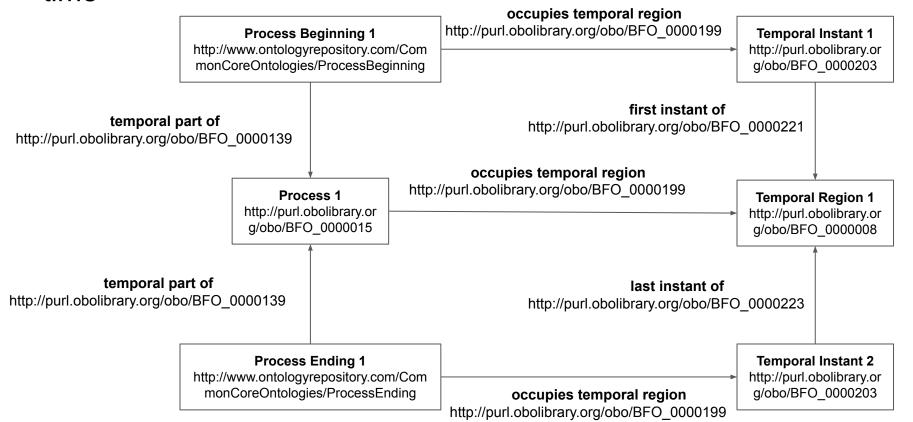


Tracking spatiotemporal and temporal information for processes

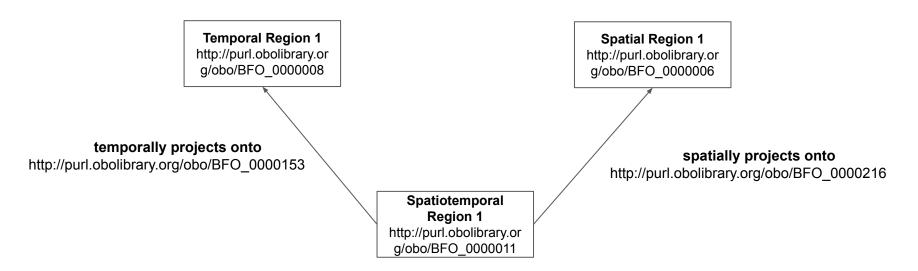


occupies spatiotemporal region http://purl.obolibrary.org/obo/BFO_0000200

Starting and ending processes in time



Separating space and time information from spacetime information



Inserting dates rdfs:subclassOf rdfs:subclassOf Calendar date identifier (class) **Date Identifier (class) Temporal Interval Identifier (class)** http://www.ontologyrepository.com http://www.ontologyrepository.com http://www.ontologyrepository.com/C /CommonCoreOntologies/Calenda ommonCoreOntologies/TemporalInte /CommonCoreOntologies/DateIde rDateIdentifier ntifier rvalldentifier rdf:type designates http://www.ontologyrepository.com/Co Calendar Date Identifier 1 (e.g. mmonCoreOntologies/designates **Temporal Region 1** "Tuesday") http://purl.obolibrary.org/ http://www.ontologyrepository.com/Comm obo/BFO 0000008 onCoreOntologies/CalendarDateIdentifier generically depends on http://purl.obolibrary.org/obo/BFO 0000084 **Information Bearing Entity 1** datetime http://www.ontologyrepository.com/Commo value 1 nCoreOntologies/InformationBearingEntity has datetime value http://www.ontologyrepository.com/Comm onCoreOntologies/has_datetime_value

The white boxes depict instances of classes with the corresponding IRI. Arrows are relations of the corresponding IRI. Gray boxes depict classes with the corresponding IRI.

Diamonds depict instances of datatypes. Rounded boxes are classes with the corresponding IRI.

Measurement Data

Measurement Information Content Entity 1 (e.g. "Mass of Pencil")

http://www.ontologyrepository.com/Commo nCoreOntologies/MeasurementInformation ContentEntity The white boxes depict instances of classes with the corresponding IRI. Arrows are relations of the corresponding IRI. Gray boxes depict classes with the corresponding IRI..

Diamonds depict instances of datatypes. Rounded boxes are classes with the corresponding IRI.

generically depends on

http://purl.obolibrary.org/obo/BFO_0000084

http://www.ontole

Information Bearing Entity 1
http://www.ontologyrepository.com/Commo
nCoreOntologies/InformationBearingEntity

http://www.ontologyrepository.com/Comm onCoreOntologies/has_datetime_value

has decimal value

integer value 1 (e.g. "8.4")

uses measurement unit

http://www.ontologyrepository.com/Common CoreOntologies/uses_measurement_unit

Gram Measurement Unit

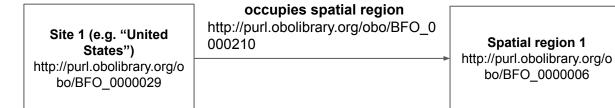
http://www.ontologyrepository.com/Commo nCoreOntologies/MeasurementUnitOfMass

rdf:type

Measurement Unit of Mass (Class)

http://www.ontologyrepository.com/CommonCoreOntologies/MeasurementUnitOfMass

Sites and spatial regions



Site of a Process

Process 1 (e.g. "Presidential elections)

http://purl.obolibrary.or g/obo/BFO_0000015 occurs at

http://www.ontologyrepository.com/CommonCoreOntologies/occurs_at

Site 1 (e.g. "United States) http://purl.obolibrary.org/o

tp://puri.obolibrary.org/o bo/BFO_0000029

Location of Independent Continuants

