FRED as an Event Extraction Tool

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Events are elusive

- even human annotators do not agree on what is an event and its aspects (space, time, participants) [Aroyo and Welty, Derive 2012]

- more issues when extracting events from text: entailment, causal and temporal relations, modality, negation, polarity, etc.

- we extract event-like entities from text

  - given an explicit semantics of putative events in natural language and linked data

  - for tasks like summarization, sentiment analysis, text similarity, KB bootstrapping, etc.
• The Black Hand might not have decided to barbarously assassinate Franz Ferdinand after he arrived in Sarajevo on June 28th, 1914
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FRÉD aligns to WordNet, VerbNet, FrameNet, DOLCE+DnS, DBpedia, and schema.org.

FRÉD integrates NER, SenseTagging, WSD, Tax. Ind., Relation/Event/Role Extraction.

http://wit.istc.cnr.it/stlab-tools/fred

“FRÉD’s reading will extremely love the Semantic Web.”

FRÉD is Frame-based.

LOD and ODP design.

High EE accuracy.

Apache Stanbol

EARM RKE RDF, OWL

REST
EE tasks in FRED

- **Event identity**: FRED focuses on events expressed by verbs, propositions, terms, and named entities (possibly resolved), as well as on event graphs.

- **Event classification**: FRED uses Linked Data-oriented induction of types for identified events, reusing e.g. VerbNet, WordNet, DBpedia, schema.org, and DOLCE+DnS as reference ontologies.

- **Event unity**: FRED applies semantic role labeling to verbs and propositions (“situations”) in order to detect event boundaries, and frame detection for resolving roles against a shared event ontology (VerbNet, FrameNet, ...).

- **Event modifiers**: FRED extracts logical negation, basic modalities, and adverbial qualities, applied to verbs and propositions, which can also be used as event judgment indicators.

- **Event relations**: FRED relates events via the role structure of verbs and propositions, and extracts tense and entailment relations between them.
PREFIX dul: <http://www.ontologydesignpatterns.org/ont/dul/DUL.owl#>
PREFIX vnrole: <http://www.ontologydesignpatterns.org/ont/vn/abox/role/>
PREFIX boxing: <http://www.ontologydesignpatterns.org/ont/boxer/boxing.owl#>
PREFIX boxer: <http://www.ontologydesignpatterns.org/ont/boxer/boxer.owl#>
PREFIX : <http://www.ontologydesignpatterns.org/ont/boxer/test.owl#>


WHERE {
{?e a boxing:Situation} UNION {?e a ?class . ?class rdfs:subClassOf+ dul:Event}}

?e ?p ?x

    vnrole:Theme)

FILTER NOT EXISTS {?e vnrole:Theme ?x . ?e vnrole:Agent ?y

FILTER (?x != ?y)}
WHERE {
{{?e a boxing:Situation} UNION {?e a ?class . ?class rdfs:subClassOf+ dul:Event}}
?e ?p ?x
FILTER NOT EXISTS {?e vnrole:Theme ?x . ?e vnrole:Agent ?y
FILTER (?x != ?y)}
OPTIONAL { {{?e ?r ?e1} UNION {?e ?s ?z . ?z ?t ?e1}} {{?e1 a boxing:Situation} UNION
{?e1 a ?class1 . ?class1 rdfs:subClassOf+ dul:Event}}
FILTER (?e1 != ?e1)}
OPTIONAL {?e ?rol ?filler
FILTER (?rol = vnrole:Topic || ?rol = vnrole:Beneficiary || ?rol = vnrole:Patient
|| ?rol = vnrole:Patient1 || ?rol = vnrole:Patient2)}
OPTIONAL {?e vnrole:Theme ?theme . ?e vnrole:Agent ?y
FILTER (?x != ?y)}}
WHERE {
{{?e a boxing:Situation} UNION {?e a ?class . ?class rdfs:subClassOf+ dul:Event}}
?e ?p ?x
 || \?p = vnrole:Actor1 || \?p = vnrole:Actor2 || \?p = vnrole:Theme)
FILTER NOT EXISTS {?e vnrole:Theme ?x . ?e vnrole:Agent ?y
FILTER (?x != ?y)}
OPTIONAL {{?e a ?el} UNION {?e ?s ?z . ?z ?t ?el}} {{?el a boxing:Situation} UNION
 {?el a ?class1 . ?class1 rdfs:subClassOf+ dul:Event}}
FILTER (?e != ?el)}
OPTIONAL {?e ?rol ?filler
FILTER (?rol = vnrole:Topic || ?rol = vnrole:Beneficiary || ?rol = vnrole:Patient ||
 ?rol = vnrole:Patient1 || ?rol = vnrole:Patient2)}
OPTIONAL {?e vnrole:Theme ?theme . ?e vnrole:Agent ?y
FILTER (?x != ?y)}
OPTIONAL {?e ?aspect ?mod
FILTER (?aspect = owl:sameAs || ?aspect = owl:sameAs || ?aspect = dul:hasQuality ||
 ?aspect = boxing:hasModality || ?aspect = boxing:hasTruthValue)})
• The Renaissance was a cultural movement that spanned in Italy from the 14th to the 17th century. Some sources report that the Renaissance might have been started by Greek scholars from Constantinople.
Allen’s tense relations

disambiguated types