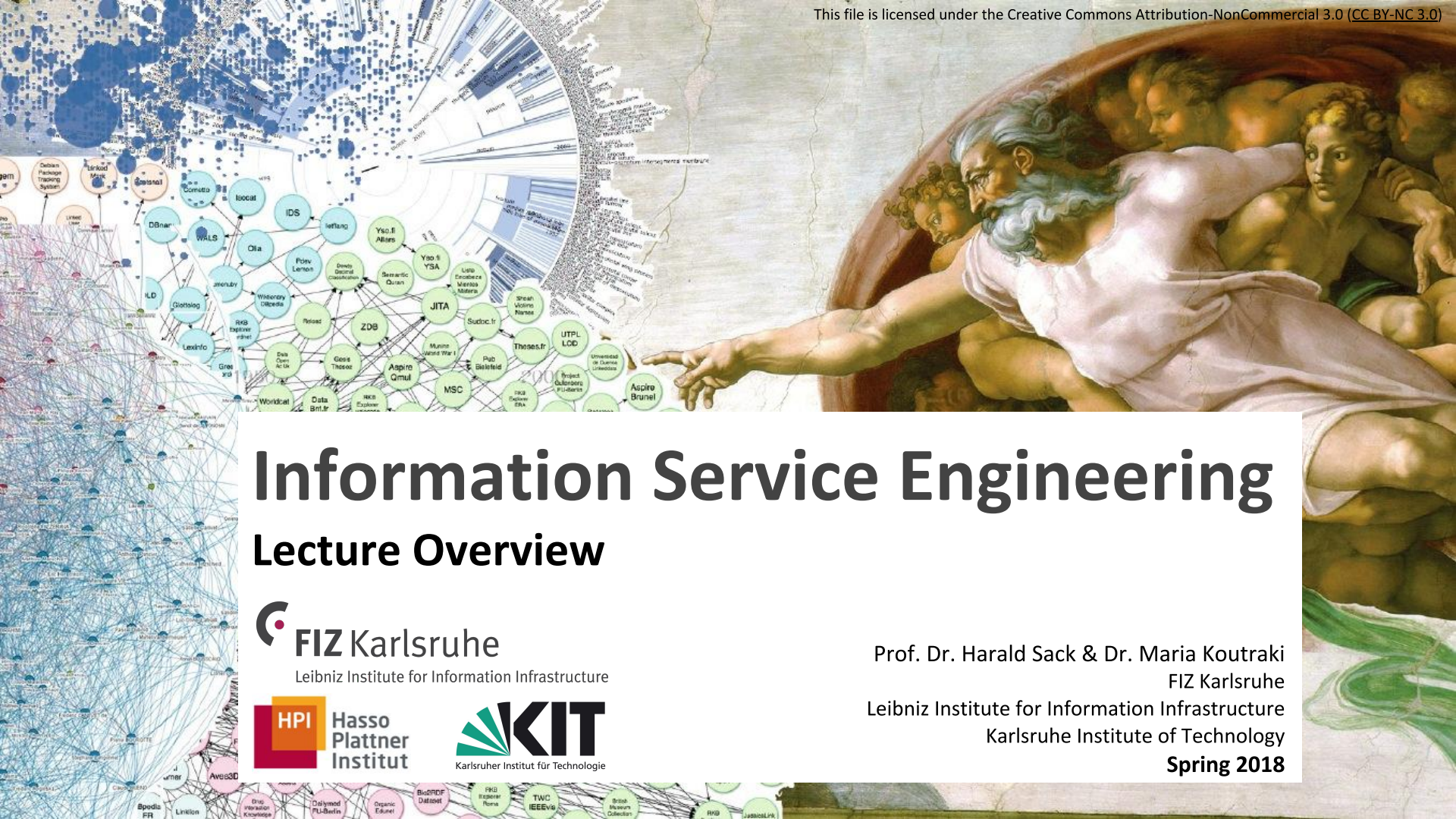


Information Service Engineering

Lecture Overview

FIZ Karlsruhe
Leibniz Institute for Information Infrastructure

HPI Hasso Plattner Institut

KIT Karlsruher Institut für Technologie

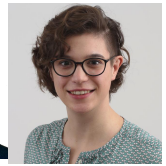
Prof. Dr. Harald Sack & Dr. Maria Koutraki
FIZ Karlsruhe
Leibniz Institute for Information Infrastructure
Karlsruhe Institute of Technology

Spring 2018

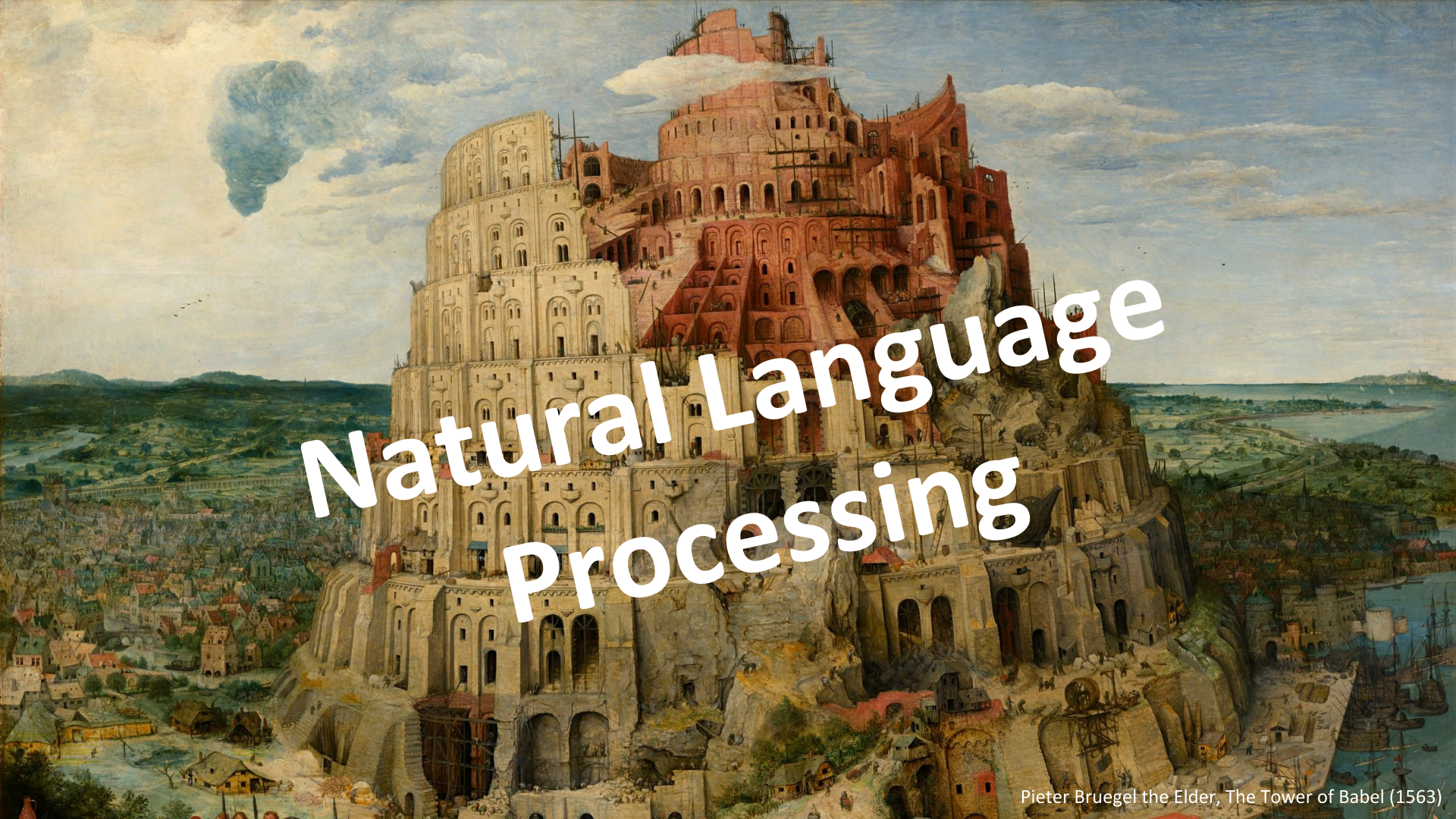
Information Service Engineering

- **Prof. Dr. Harald Sack**
  - FIZ Karlsruhe - Leibniz Institute for Information Infrastructure
  - Karlsruhe Institute of Technology

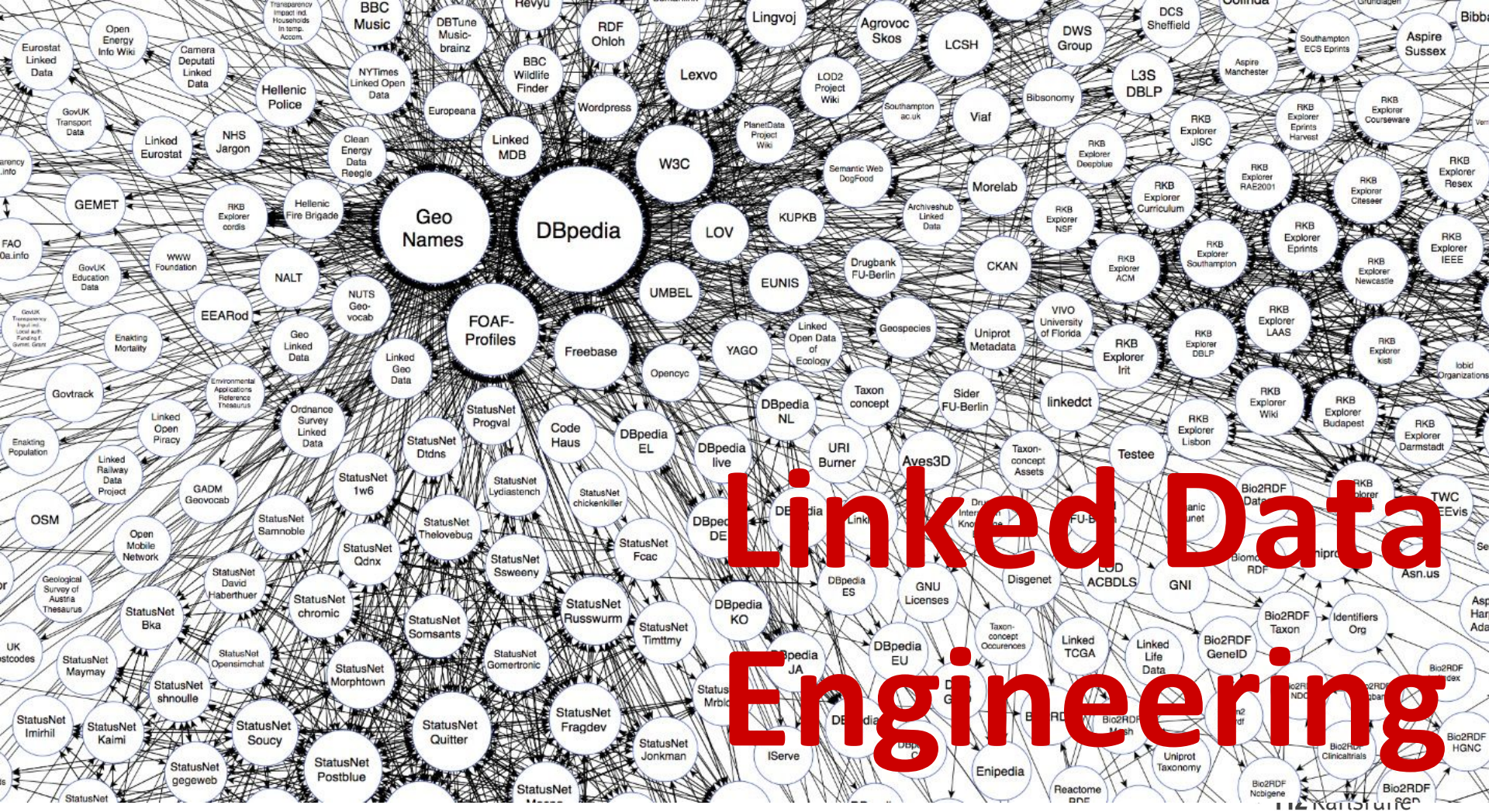
- **Dr. Maria Koutraki**
  - FIZ Karlsruhe - Leibniz Institute for Information Infrastructure
  - Karlsruhe Institute of Technology



- **Tutors**
  - Tabea Tietz, B.A.
  - Farshad B. Moghaddam, M.Sc. (PhD cand.)
  - Rima Türker, M.Sc. (PhD cand.)



Pieter Bruegel the Elder, The Tower of Babel (1563)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DBTune Music-brainz
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NYTimes Linked Open Data
Hellenic Police
Linked Eurostat
NHS Jargon
Clean Energy Data Reegle
Hellenic Fire Brigade
GEMET
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WWW Foundation
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NUTS Geo-vocab
EEARod
Geo Linked Data
Linked Geo Data
Enakting Mortality
Govtrack
Ordnance Survey Linked Data
Linked Open Piracy
Enakting Population
Linked Railway Data Project
GADM Geovocab
OSM
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VIVO University of Florida
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Semantic Web DogFood
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Viaf
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LOD2 Project Wiki
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GovUK Education Data
GovUK Transparency Impact ind. Households In temp. Accom.
Environmental Applications Reference Thesaurus
Linked Geo Data
Linked Open Piracy
Linked Railway Data Project
Open Mobile Network
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URI Burner
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Linked Life Data
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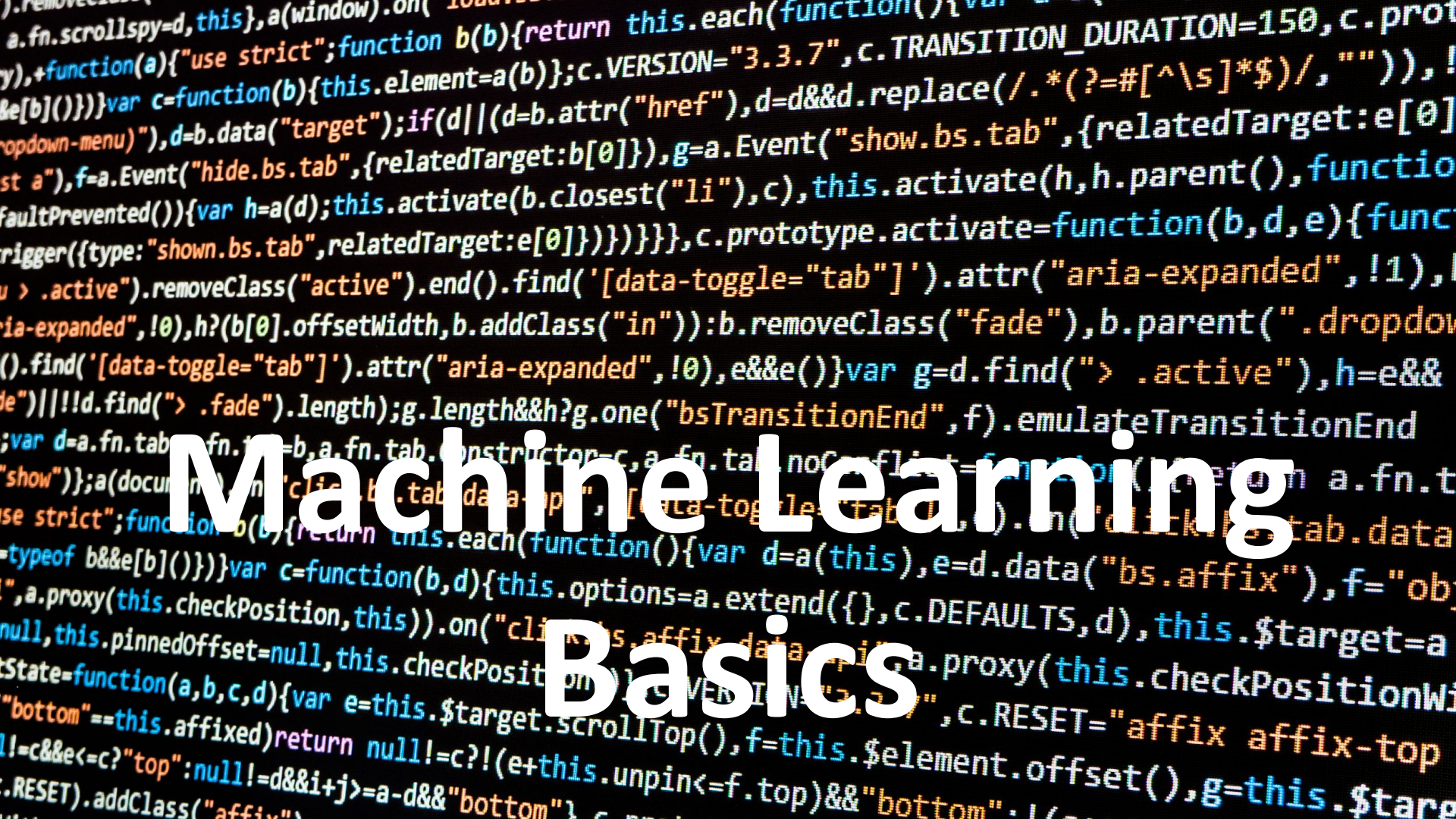
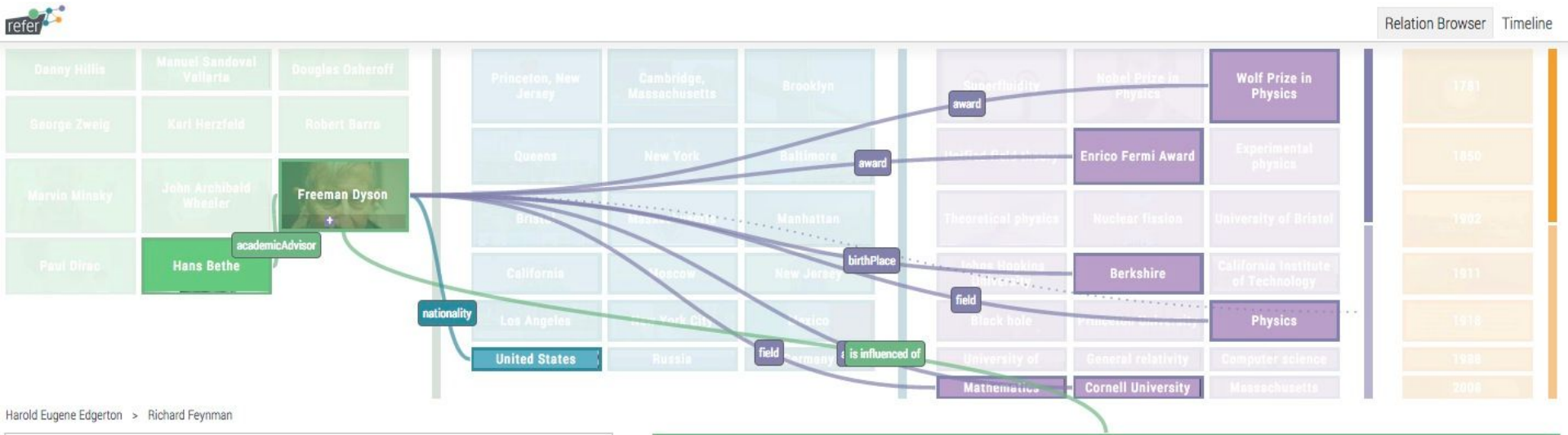
Southampton ECS Eprints
Aspire Sussex
Lingvoj
Revyu

From Text to Knowledge Graph


Machine Learning
Basics

Knowledge Mining and Exploratory Search



Harold Eugene Edgerton > Richard Feynman

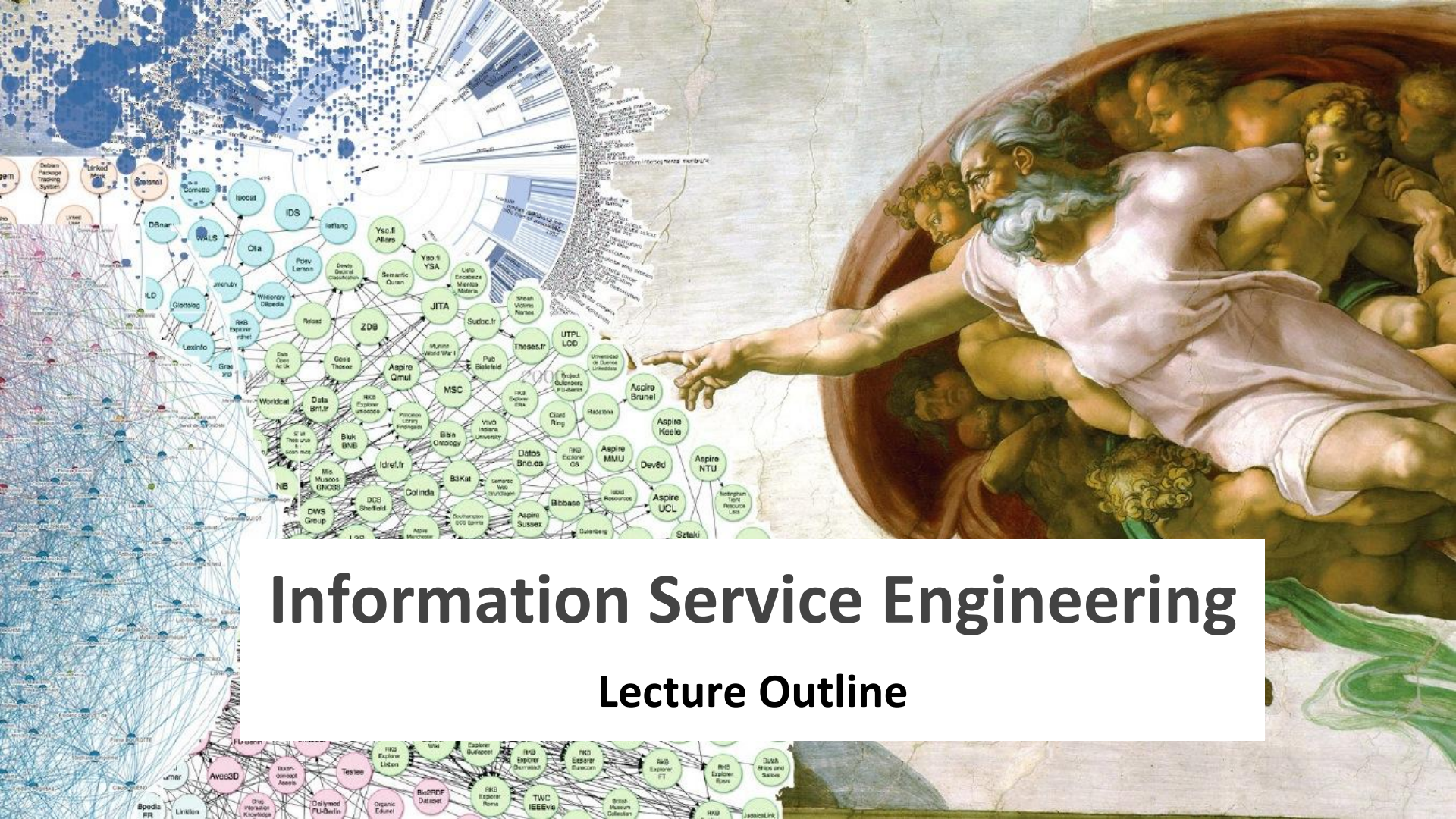
15 Recommended Articles:

#1	Frederick Reines And The Neutrino
#2	Sin Itiro Tomonaga And Quantum Electrodynamics
#3	Felix Bloch And The Nuclear Magnetic Resonance Method
#4	George Gamow And His Fundamental Views On The Foundations Of Science
#5	Robert Mulliken And The Molecular Orbitals
#6	Hans Bethe And The Energy Of The Stars

Richard Feynman

Richard Phillips Feynman (/ˈfaɪnmən/; May 11, 1918 – February 15, 1988) was an American theoretical physicist known for his work in the path integral formulation of quantum mechanics, the theory of quantum electrodynamics, and the physics of the superfluidity of supercooled liquid helium, as well as in particle physics (he proposed the parton model). For his contributions to the development of quantum electrodynamics, Feynman, jointly with Julian Schwinger and Sin-Itiro Tomonaga, received the Nobel Prize in Physics in 1965. He developed a widely used pictorial representation scheme for the mathematical expressions governing the behavior of subatomic particles, which later became known as Feynman diagrams. During his lifetime, Feynman became one of the best-known scientists in the world. In a 1999 poll of 130 leading physicists worldwide by the British journal

DBpedia: Richard Feynman



Information Service Engineering

Lecture Outline

Information Service Engineering

Lecture 1: Natural Language Processing

1.1 Information and Knowledge

1.2 Language and Understanding

1.3 NLP Techniques and Challenges

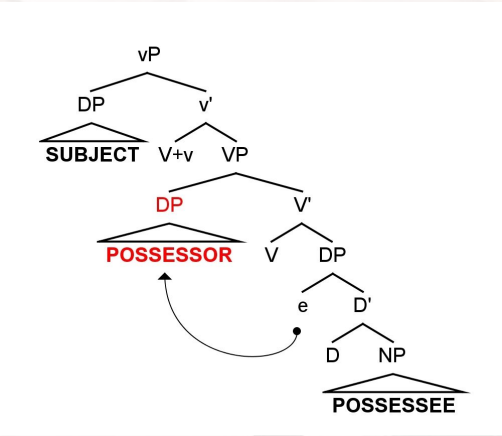
1.4 Linguistic Basics

1.5 Morphology

1.6 Evaluation, Precision and Recall

1.6E - Excursion

1.7 Regular Expressions



Information Service Engineering

Lecture 2: Natural Language Processing II

2.1 Finite State Automata

2.2 Finite State Transducers

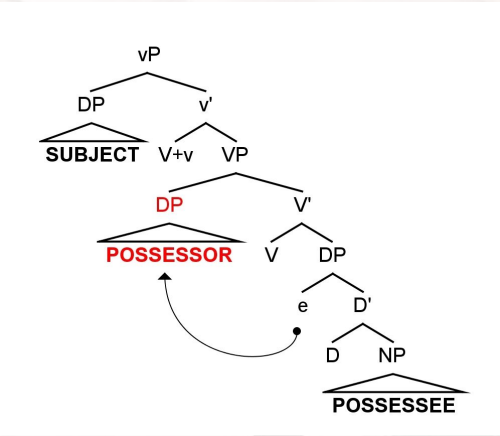
2.3 Language Model and N-Grams

2.4 Language Model and N-Grams II

2.5 Language Model and N-Grams III

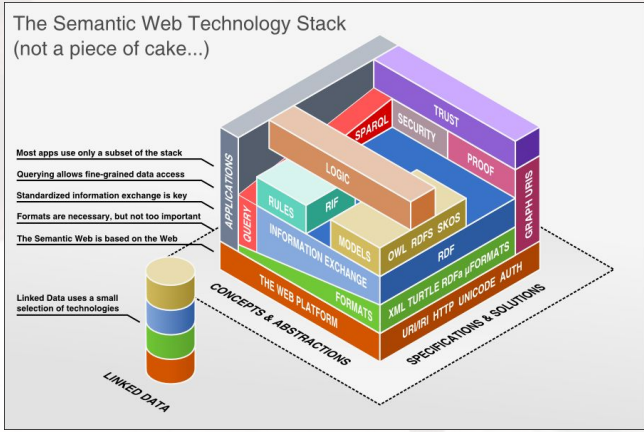
2.6 Part-of-Speech Tagging

2.7 Part-of-Speech Tagging II



Information Service Engineering

Lecture 3: Linked Data Engineering



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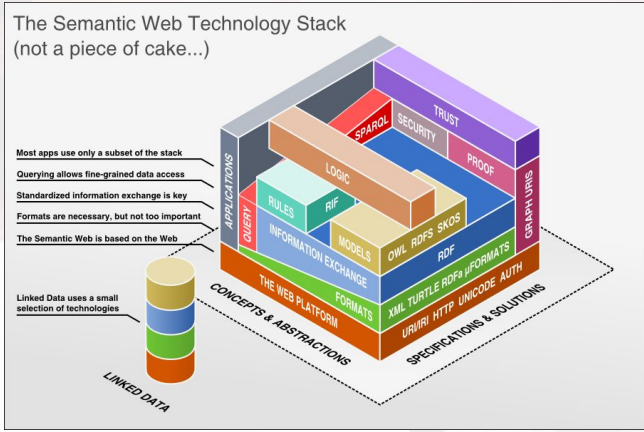
Information Service Engineering

Lecture 4: Linked Data Engineering II



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Lecture 5: Basic Machine Learning

5.1 A Brief History of AI

5.2 Introduction to Machine Learning

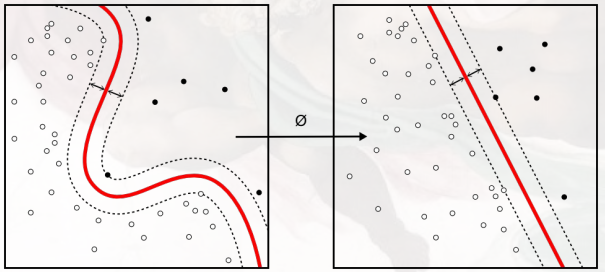
5.3 Evaluation and Generalization Problems

5.4 Basic ML Algorithms

5.5 Basic ML Algorithms II

5.6 Unsupervised Learning

5.7 Deep Learning



Information Service Engineering

Lecture 6: Putting it All Together

6.1 Linked Data Programming

6.2 Knowledge Mining and Information Extraction

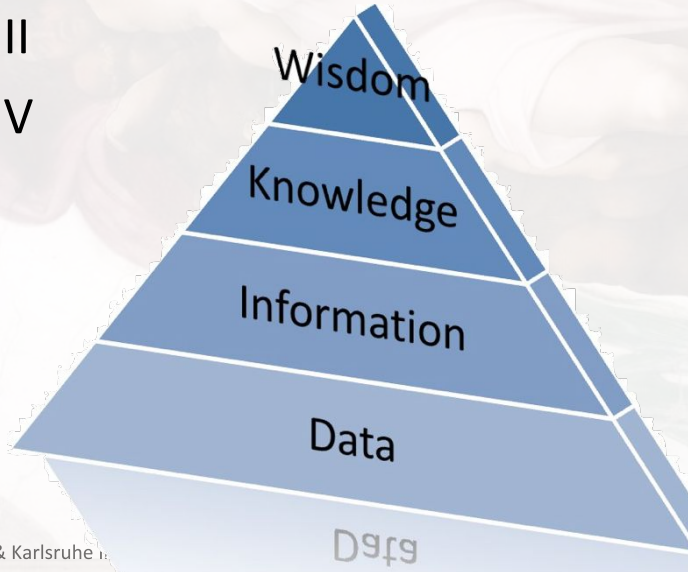
6.3 Knowledge Mining and Information Extraction II

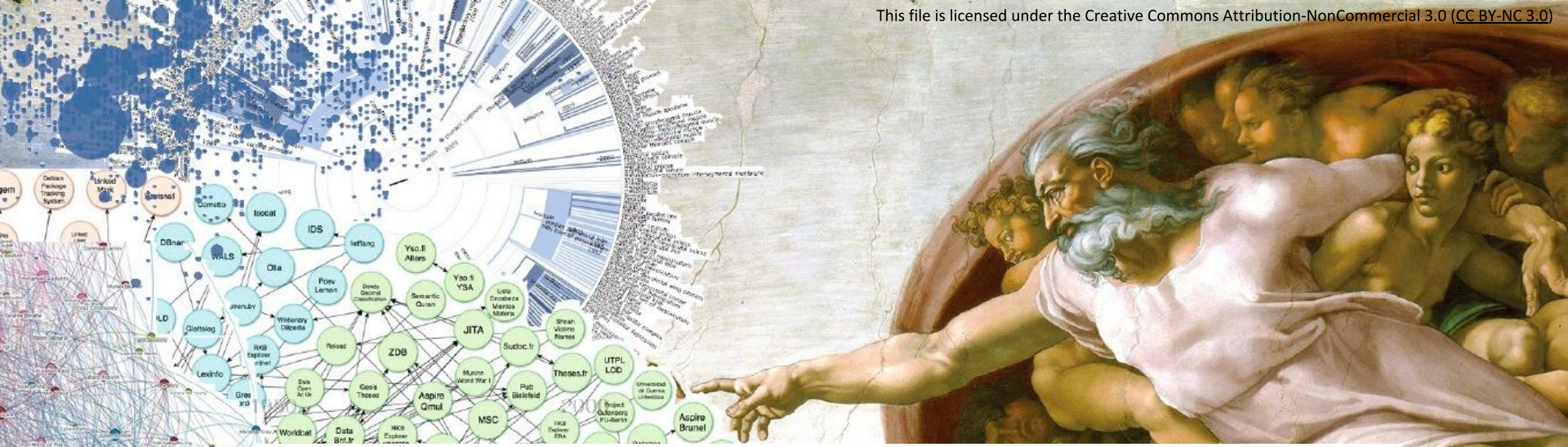
6.4 Knowledge Mining and Information Extraction III

6.5 Knowledge Mining and Information Extraction IV

6.6 Semantic Search

6.7 Exploratory Search and Recommender Systems





Information Service Engineering

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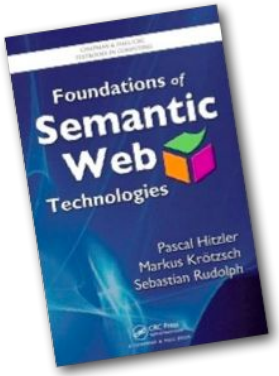
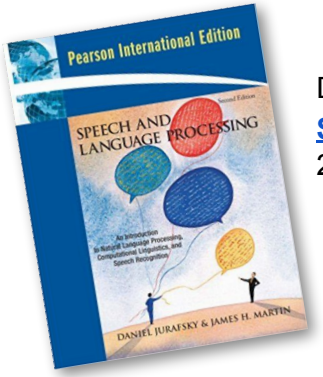
Spring 2018

Information Service Engineering

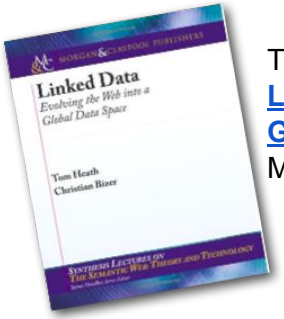
Bibliographic References



P. Hitzler, M. Krötzsch, S. Rudolph:
Foundations of Semantic Web Technologies,
CRC Press, 2009.



D. Jurafsky, J.H. Martin,
Speech and Language Processing,
2nd ed., Pearson Int., 2009.



T. Heath, Ch. Bitzer:
Linked Data - Evolving the Web into a Global Data Space,
Morgan & Claypool, 2011.

- R. Baeza-Yates, B. Ribeiro-Neto,
Modern Information Retrieval, 2nd ed., Addison Wesley, 2010.