

Natural Language Processing

NLP in one day

KING'S
College
LONDON



NIHR | Maudsley Biomedical
Research Centre

Introduction



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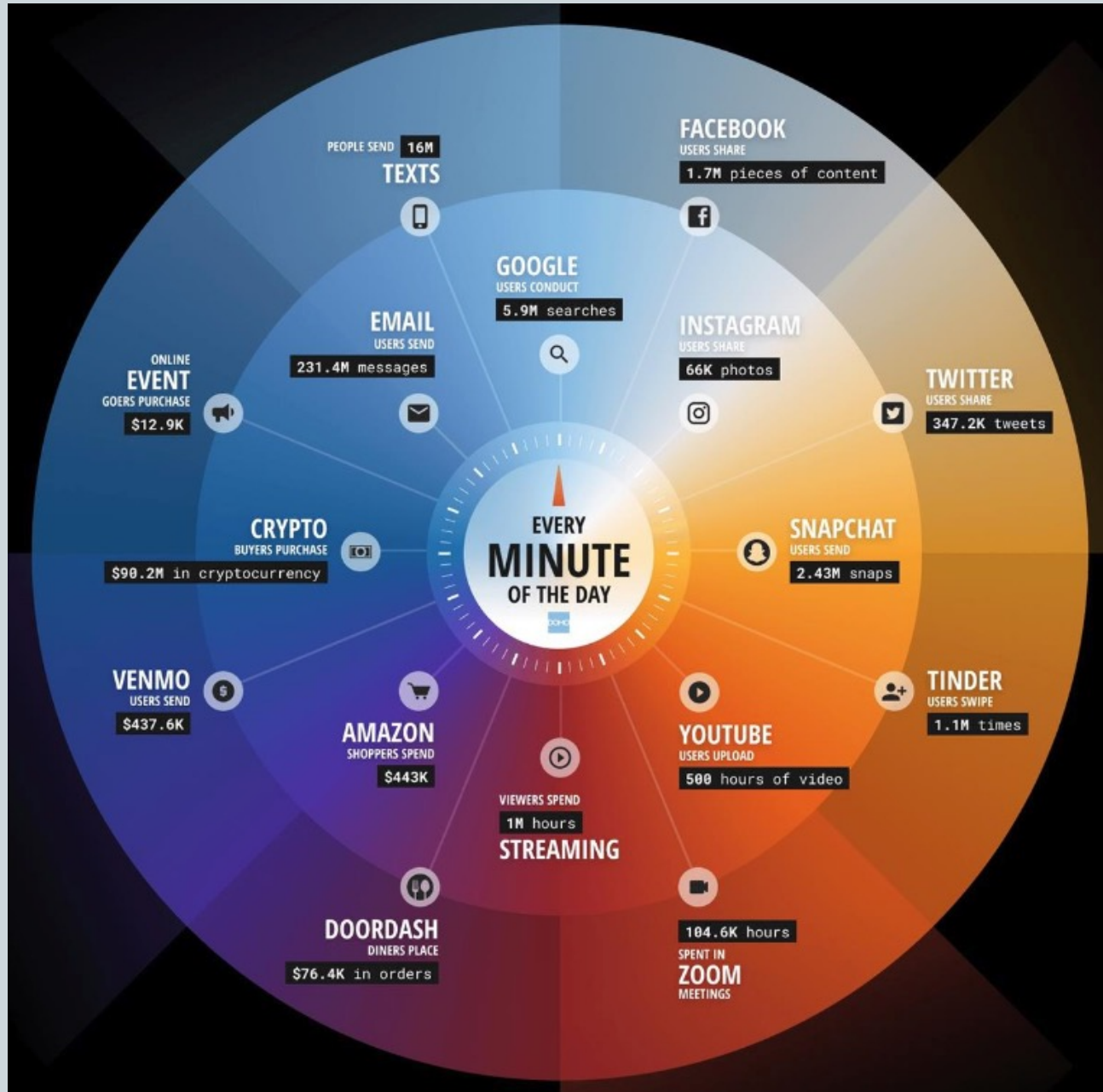


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Text is everywhere



Data Never Sleeps 10.0
from domo.com (April
2022)

Generative AI



Write a short definition of natural language processing



Natural Language Processing (NLP) is a field of artificial intelligence that focuses on enabling computers to understand, interpret, and generate human language. It involves analyzing and processing natural language data, such as text or speech, to perform tasks like translation, sentiment analysis, speech recognition, and information extraction. NLP combines linguistics, computer science, and machine learning to bridge the gap between human communication and computer understanding.



Electronic health records (EHRs) – structured and unstructured information

HAEMATOLOGY

HAEMOGLOBIN (g/L) 151
HCT 0.422
RED CELL COUNT 4.83
MCV 87.4
MCH 31.3
MCHC (g/L) * 358
RDW
PLATELET COUNT
MPV
WHITE CELL COUNT
Neutrophils
Lymphocytes
Monocytes
Eosinophils
Basophils
ESR

BIOCHEMISTRY

SODIUM
POTASSIUM
CHLORIDE
BICARBONATE
UREA
CREATININE
estimated GFR

Clinical Findings

Concept ID	Preferred term
16932000	Nausea and vomiting
68566005	Urinary tract infectious disease
38341003	Hypertensive disorder
49436004	Atrial fibrillation
49218002	Hip pain
301011002	Escherichia coli urinary tract infect
40835002	Coffee ground vomiting
167667006	Fecal occult blood: negative

Procedures

Concept ID	Preferred term
52734007	Total replacement of hip
117010004	Urine culture
76009000	Esophagogastroduodenoscopy
91251008	Physical therapy procedure

Reason: CHECK ETT TUBE PLACEMENT, ?PNA, CHF

[**Signature 1**]

UNDERLYING MEDICAL CONDITION:

85 y/o male s/p acute mi and catheterization now in ccu with cardiogenic shock

REASON FOR THIS EXAMINATION:

CHECK ETT TUBE PLACEMENT

?PNA

CHF

[**Signature 1**]

FINAL REPORT

CLINICAL INDICATION: Assess endotracheal tube placement in patient with congestive heart failure.

Comparison is made to previous study of one day earlier. An endotracheal tube is present, in satisfactory position. A Swan-Ganz catheter terminates in the proximal left pulmonary artery and has been withdrawn in the interval. An intraaortic balloon pump terminates about 3.3 cm below the superior aspect of the aortic knob, and a nasogastric tube terminates in the region of the gastroduodenal junction.

How much unstructured, textual information is in an EHR?

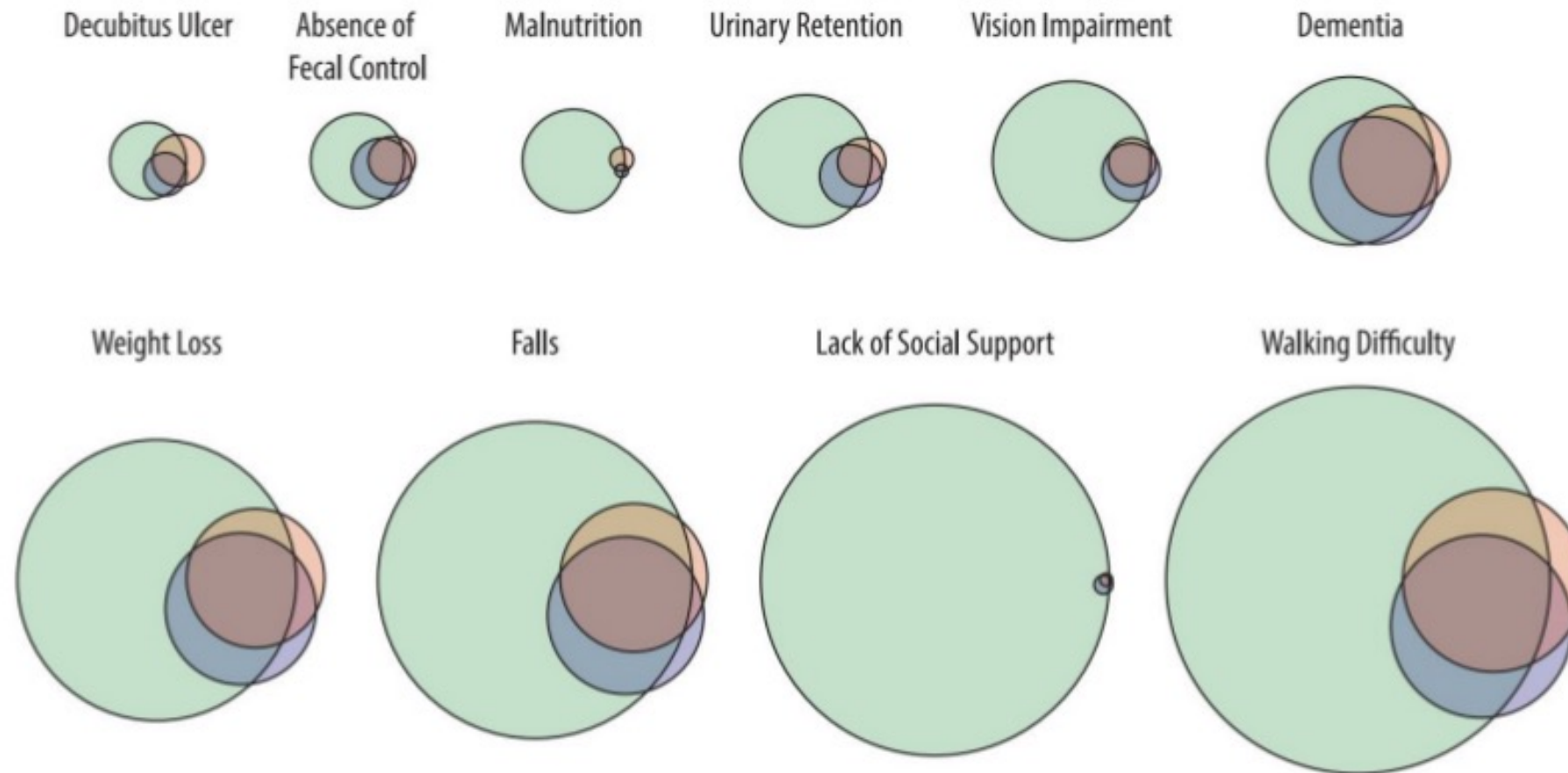
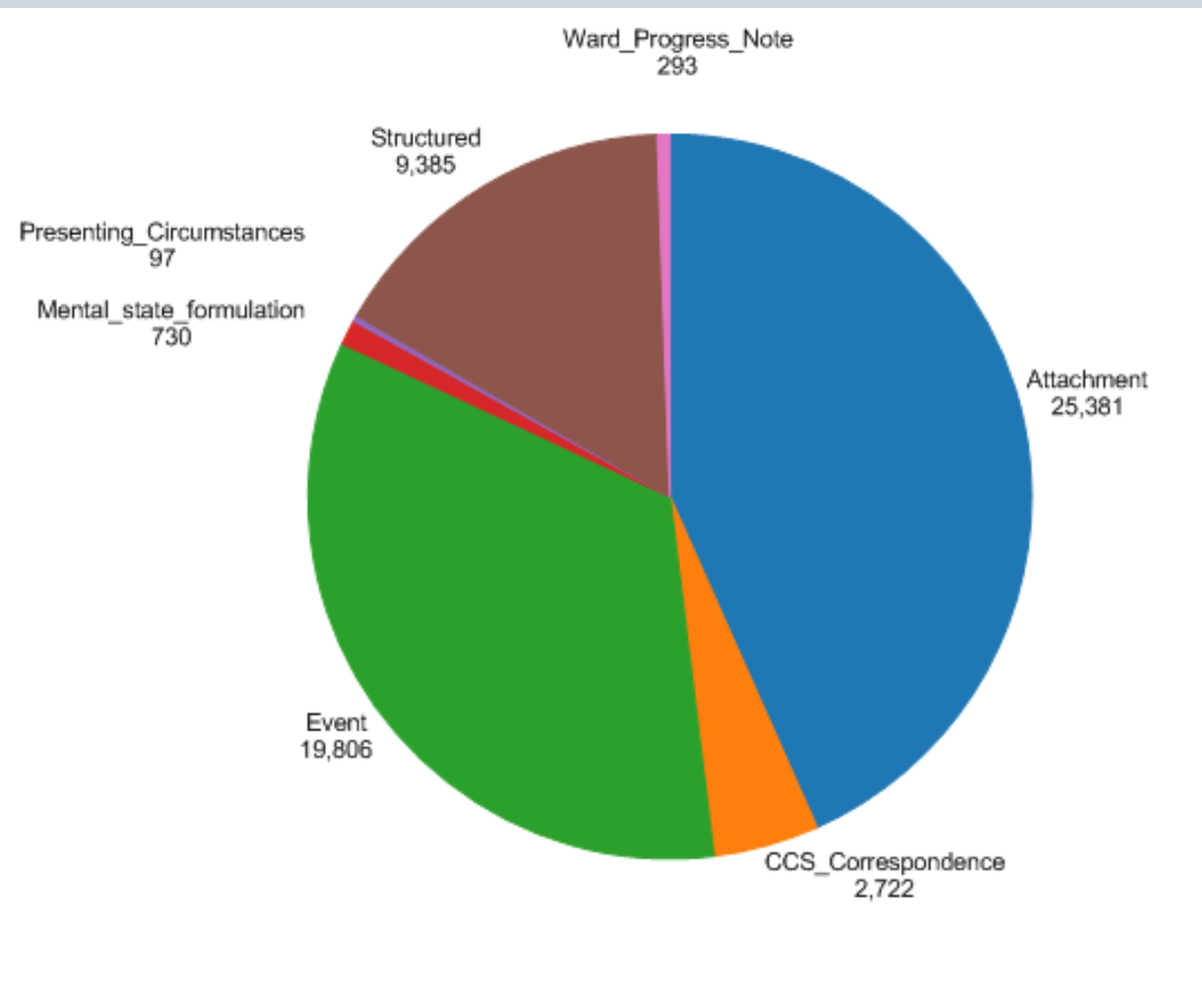


Figure 2. Green: Unstructured free text EHR data; Other colours: structured data. “The value of Unstructured Electronic Health Record Data in Geriatric Syndrome Case Identification”. (Kharrazi et al., 2018)

An example – Mini Mental State Examinations



source



Attachment



CCS_Correspondence



Event



Mental_state_formulation



Presenting_Circumstances



Structured



Ward_Progress_Note

This course

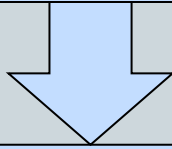
**Pre-workshop - video lectures and
study material**

You did do all of it, didn't you?

This course

Pre-workshop - video lectures and study material

You did do all of it, didn't you?



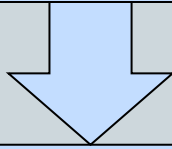
Workshop – practicals

And a few linking presentations

This course

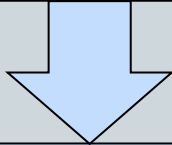
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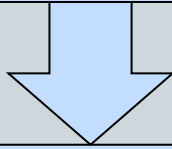


Post-workshop – self-study reading material

This course

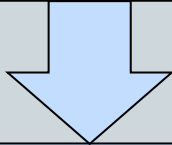
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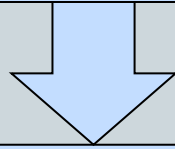
Theory, methods



This course

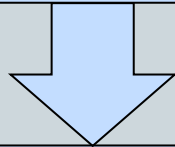
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Workshop – practicals

And a few linking presentations



Post-workshop – self-study reading material

Theory, methods



Practical techniques



Can you learn NLP in a day

- No
- Watch the pre-course material
- Go through the reading material
- Find other sources of information
- Find a collaborator!

Course material

All course material can be found on GitHub

Let's take a look:

<https://github.com/KCL-Health-NLP/nlp-one-day-workshop/tree/main>

Thank you

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<https://www.kcl.ac.uk/people/angus-roberts>