Natural Language Processing

BHI Youth Awards

KING'S College LONDON

NIHR | Maudsley Biomedical Research Centre

Introduction

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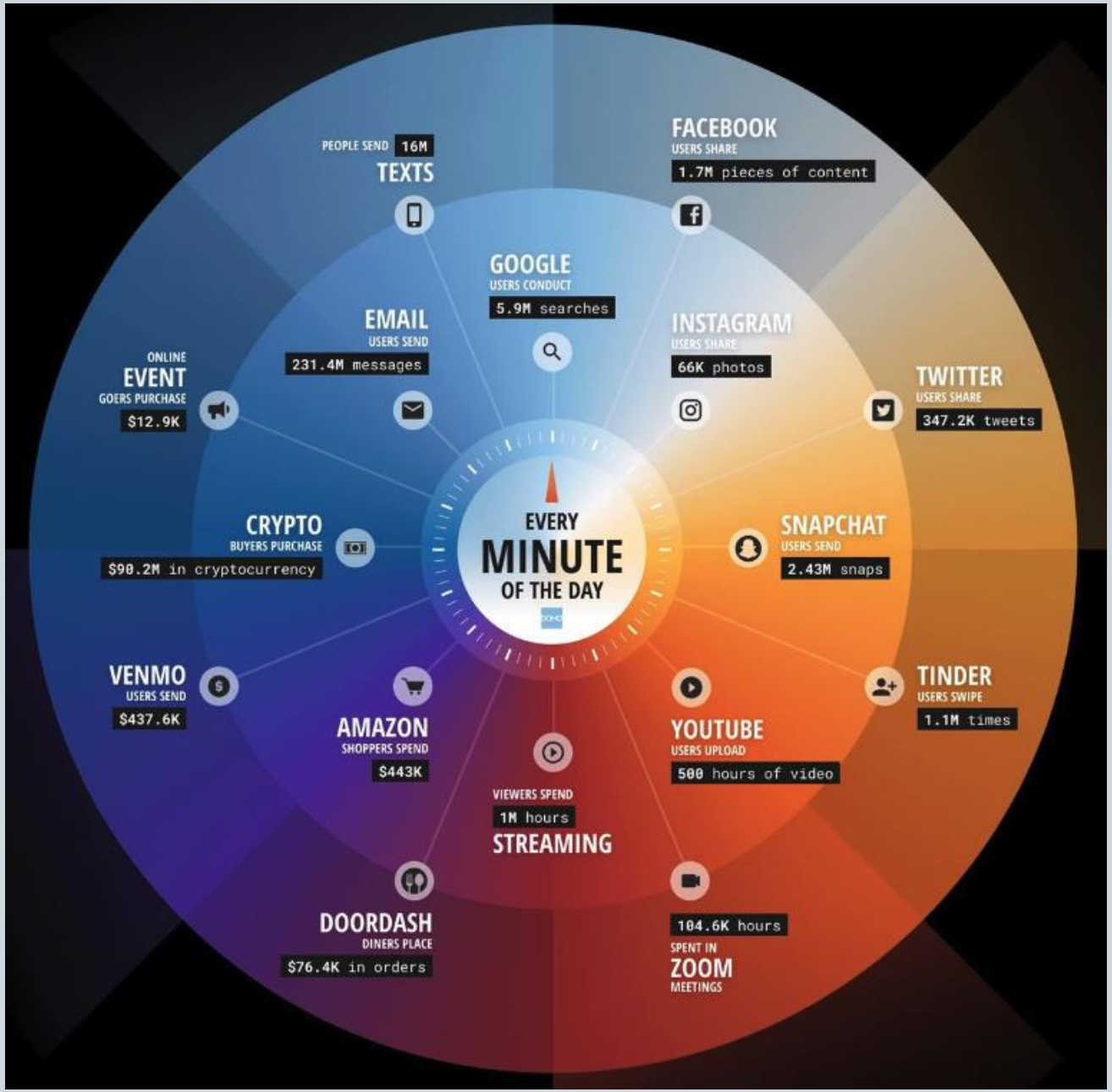
Text is everywhere



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 infec
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 catherization 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 A Swan-Ganz catheter terminates in the proximal left pulmonary artery and has been withdrawn in the interval.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?

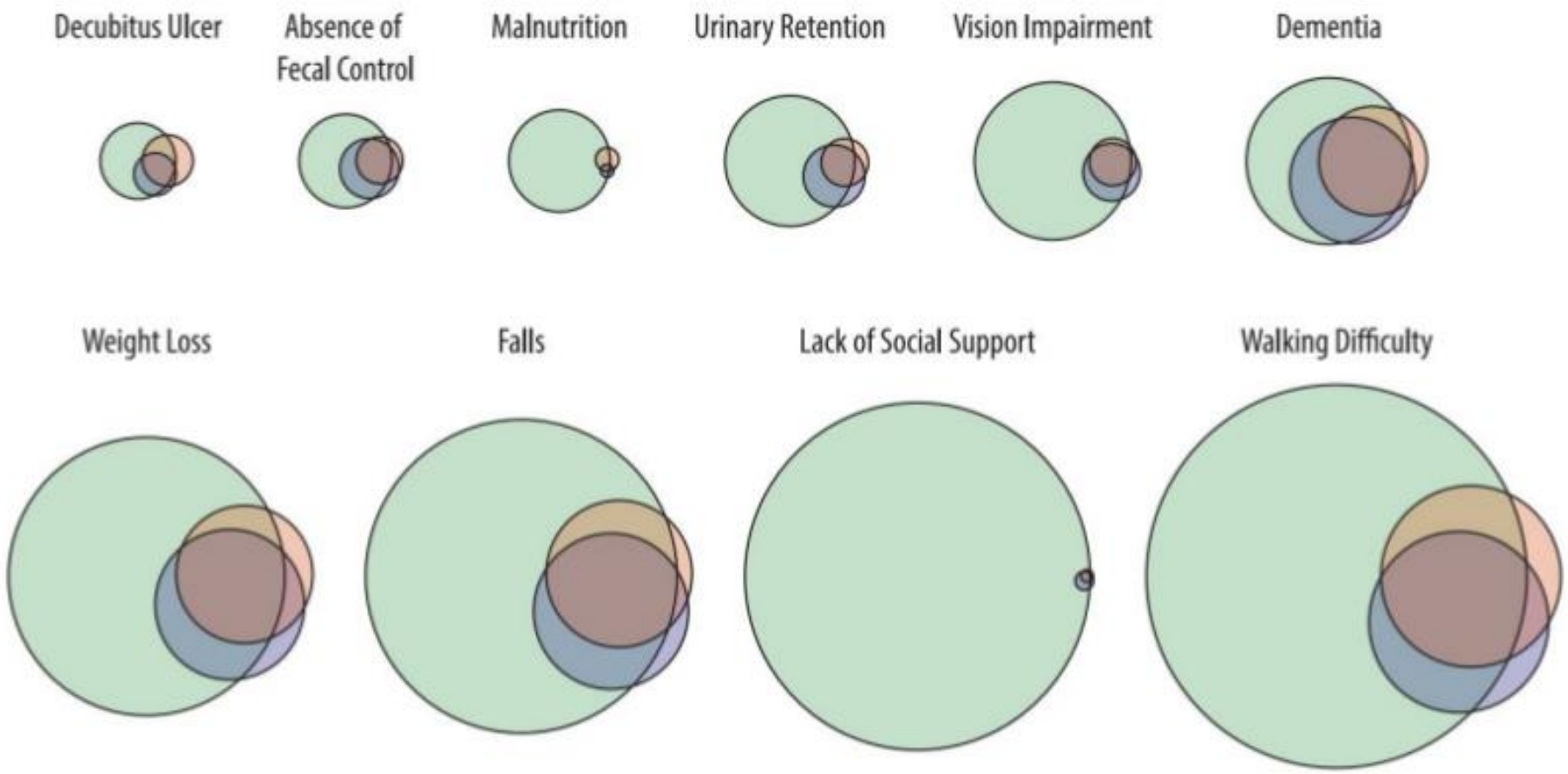
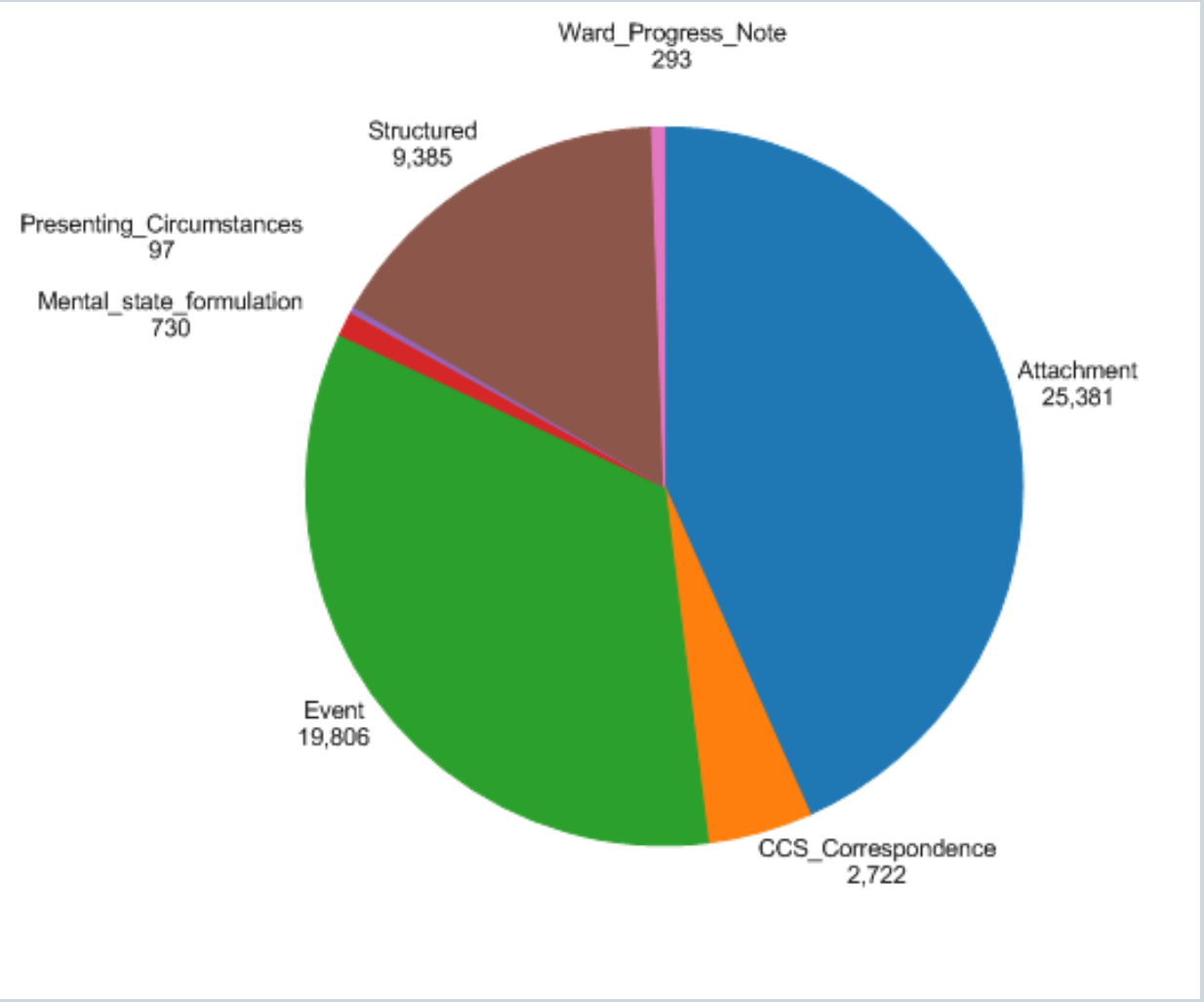


Figure 2. Green: Unstructured free text EHR data; Other colours: structured data. "The value of Unstructured Electronic Health Record Data in Geriatric Syndrome Case Identification". (Kharrazi et al., 2018)

An example – Mini Mental State Examinations



Thank you

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