

# SENTIRE 2023

Sentiment Elicitation from Natural Text  
for Information Retrieval and Extraction

1<sup>st</sup> December, ICDM 2023, Shanghai

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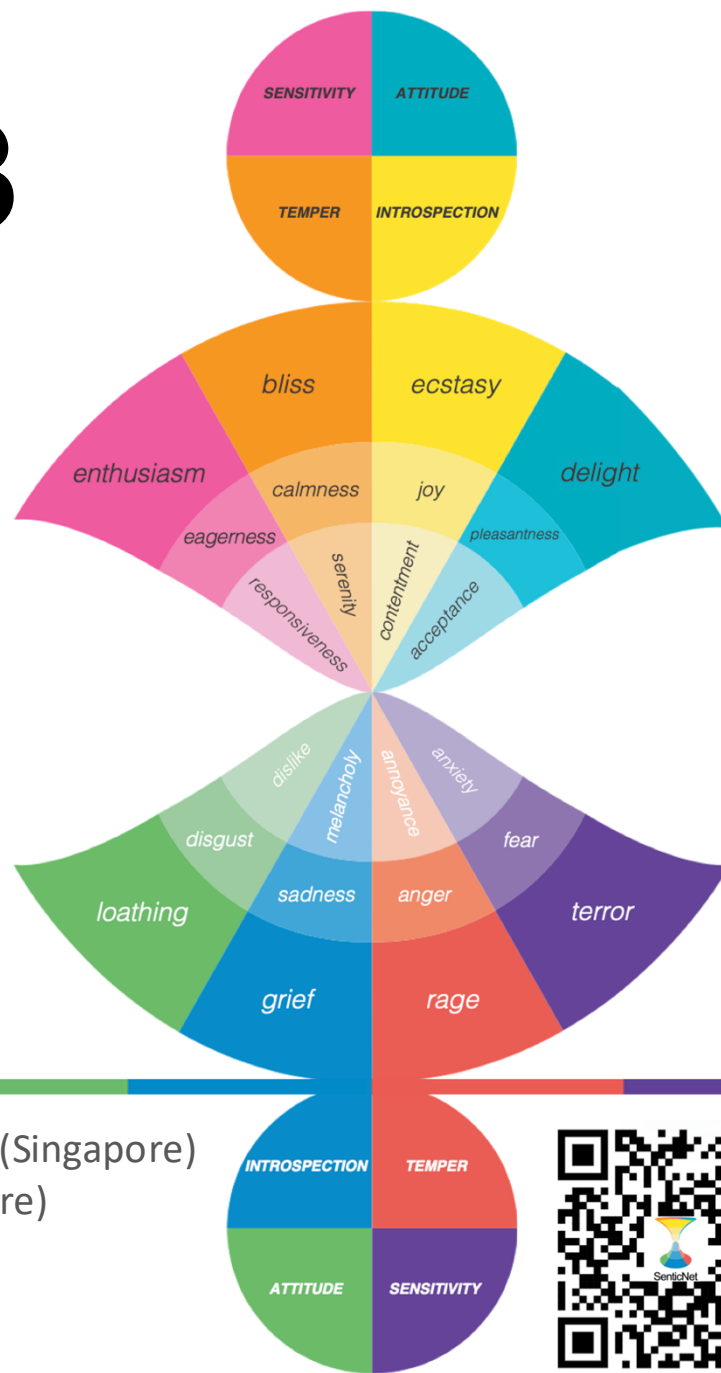
Erik Cambria & Rui Mao, Nanyang Technological University (Singapore)

Zhaoxia Wang, Singapore Management University (Singapore)

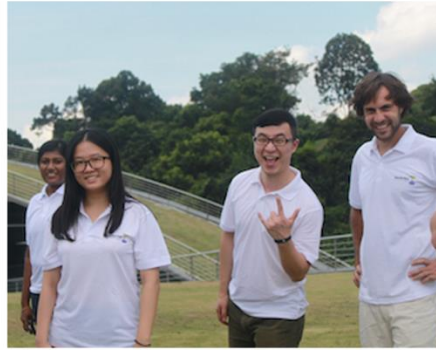
Yang Li, Northwestern Polytechnical University (China)

Newton Howard, University of Oxford (UK)

Bing Liu, University of Illinois at Chicago (USA)




# Sentic Team



<https://sentic.net/team>

# Sentic publications




Foundations of  
Sentiment Analysis



Multimodal  
Sentiment Analysis



Multilingual  
Sentiment Analysis



Multitask  
Sentiment Analysis



Conversational  
Sentiment Analysis



Financial  
Sentiment Analysis



Applications of  
Sentiment Analysis

<http://sentic.net/publications>

# Sentic resources



Downloads: <https://sentic.net/downloads>

Code: <https://github.com/senticnet>

Sentic APIs: <https://sentic.net/api>

## Sentic API Suite

powered by sentic computing

Type in text in any of the languages below  
or click on a flag to select a specific lingo

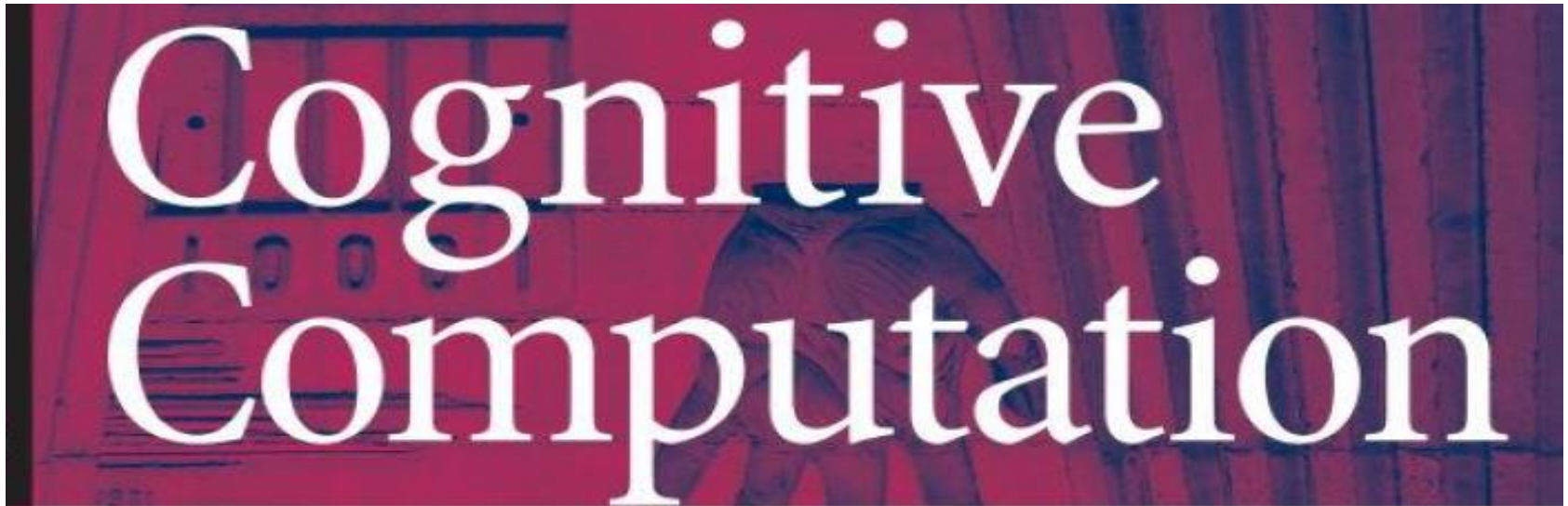


follow SenticNet on



- Concept Parsing**: A diagram showing a hierarchical tree structure of a sentence.
- Subjectivity Detection**: A 2x2 matrix with axes for Negativity (Negative, Ambivalence) and Positivity (Neutral, Positive).
- Polarity Classification**: A flowchart showing how words like 'off', 'very', 'expensive', 'not', and 'rather' are processed to determine sentiment.
- Intensity Ranking**: A semi-circular gauge showing a score of 88, ranging from -100 to 100, with 'high intensity' indicated.
- Emotion Recognition**: A grid of 16 colorful smiley faces representing different emotions.
- Sarcasm Identification**: A diagram showing a neural network architecture for processing text.
- Aspect Extraction**: A diagram showing a neural network architecture for extracting aspects from text.
- Personality Prediction**: A diagram showing a neural network architecture for predicting personality traits.
- Depression Categorization**: A diagram showing a neural network architecture for categorizing depression.
- Toxicity Spotting**: A diagram showing a neural network architecture for spotting toxicity.
- Engagement Measure**: A speedometer-like gauge with the word 'experience' on it.
- Well-being Assessment**: A circular diagram with segments for Spiritual, Cognitive, Emotional, and Physical well-being, with 'WELLBEING' in the center.

# Sentic Computing Section



If you use any sentic algorithm or resource, consider submitting to this new Collection of Cognitive Computation (5+ impact factor)

<https://sentic.net/scs.pdf>

# Cognitive Analysis for Humans & AI



## Guest Editors:

Rui Mao, Nanyang Technological University, Singapore

Qian Liu, University of Auckland, New Zealand

Xiao Li, University of Aberdeen, United Kingdom

Erik Cambria, Nanyang Technological University, Singapore

Amir Hussain, Edinburgh Napier University, United Kingdom

## Background:

The evolution of AI has profoundly shaped cognitive analysis, with a myriad of computational techniques emerging to discover cognitive patterns. Tools for sentiment, personality, psychology and concept analysis (e.g., SenticNet and MetaPro), and more have become pivotal in examining cognitive dynamics across diverse domains. The advent of cutting-edge generative AI techniques (e.g., ChatGPT and stable diffusion) has further showcased human-like capabilities in language and vision processing tasks. The understanding of these AI techniques not only empowers humans to optimize AI usage but also guards against potential risks associated with the integration of advanced technologies into various facets of our lives. While the landscape is adorned with numerous cognitive computation tools, the exploration of how to leverage these tools optimally for yielding profound insights in diverse domains and across varied research subjects remains an underexplored frontier.

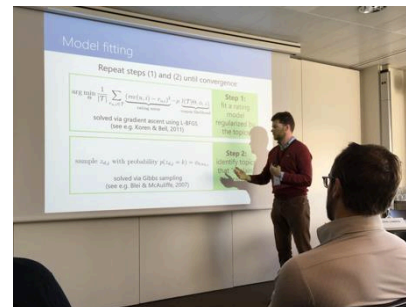
This Special Issue is motivated by illuminating this critical gap, and fostering collaboration between the AI and cognitive science communities. By soliciting high-quality research contributions, we seek to delve into the untapped potential of state-of-the-art cognitive computational methods. Our aspiration is to inspire the innovative applications of computational methods that generate significant cognitive findings, enriching both human understanding and the capabilities of AI systems.

<https://sentic.net/cahai.pdf>

# The workshop



- **SENTIRE'23 (ICDM 2023, December 1st, Shanghai)**
- **SENTIRE'22 (ICDM 2022, November 28th, Orlando)**
- **SENTIRE'21 (ICDM 2021, December 7th, Auckland)**
- **SENTIRE'20 (ICDM 2020, November 17th, Sorrento)**
- **SENTIRE'19 (ICDM 2019, November 8th, Beijing)**
- **SENTIRE'18 (ICDM 2018, November 17th, Singapore)**
- **SENTIRE'17 (ICDM 2017, November 18th, New Orleans)**
- **SENTIRE'16 (ICDM 2016, December 12th, Barcelona)**
- **SENTIRE'15 (ICDM 2015, November 14th, Atlantic City)**
- **SENTIRE'14 (ICDM 2014, December 14th, Shenzhen)**
- **SENTIRE'13 (ICDM 2013, December 7th, Dallas)**
- **SENTIRE'12 (ICDM 2012, December 10th, Brussels)**
- **SENTIRE'11 (ICDM 2011, December 11th, Vancouver)**



# This year's programme



09:00-09:05 *Welcoming and introduction* (E Cambria)

09:05-09:30 ***Knowledge Representation for Conceptual, Motivational and Affective Processes*** (SB Ho)

09:30-09:45 ***From Big to Small Without Losing it All: ChatGPT for Sentiment Analysis*** (S Woźniak)

09:45-10:00 ***From Generalized Laughter to Personalized Chuckles*** (J Bielaniewicz)

☕ COFFEE BREAK

10:30-10:45 ***Modeling Uncertainty in Personalized Emotion Prediction*** (P Miłkowski)

10:45-11:00 ***Emotion Recognition in Social Network Text Based on a Multilingual Architecture*** (J Zou)

11:00-11:15 ***A Novel Approach for Sentiment Propagation in Multilingual WordNets*** (J Kocoń)

11:15-11:30 ***Towards Model-Based Data Acquisition for Subjective Multitask NLP*** (K Kanclerz)

11:30-11:45 ***Aspect-Based Sentiment Analysis Incorporating External Knowledge*** (A Teo)

11:45-12:00 ***Video Sentiment Analysis for Child Safety*** (Y Tan)

🍽️ LUNCH BREAK

13:00-13:15 ***BLM-17m: A Large-Scale Dataset for Black Lives Matter on Twitter*** (Y Li)

13:15-13:30 ***Non-Fungible Tokens: What Makes Them Valuable?*** (Z Jiang)

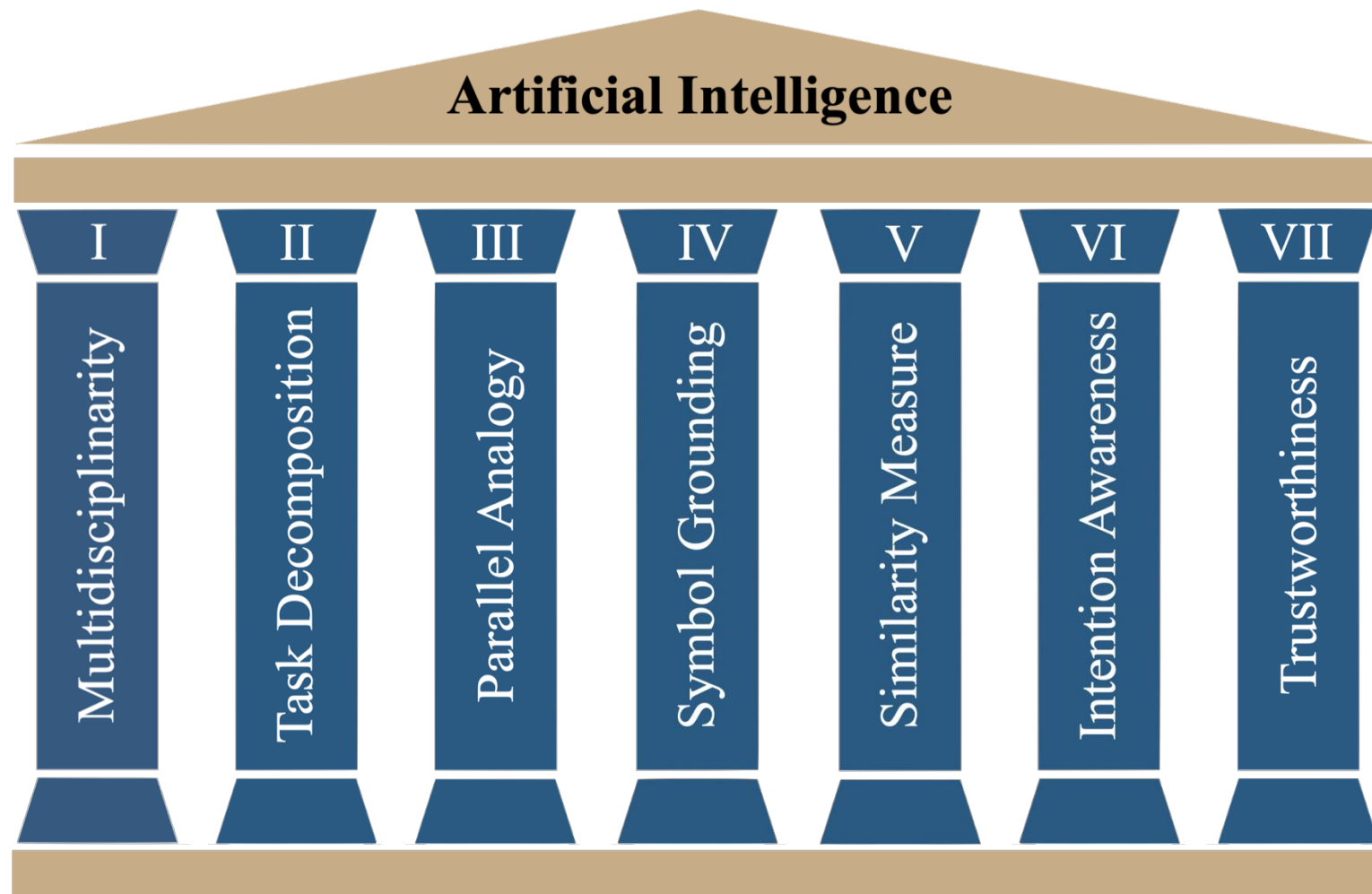
13:30-13:45 ***FinXABSA: Explainable Finance through Aspect-Based Sentiment Analysis*** (K Ong)

13:45-13:55 ***Sentiment Analysis of Primary Historical Sources*** (A Nanetti)

13:55-14:00 *Concluding remarks* (E Cambria)

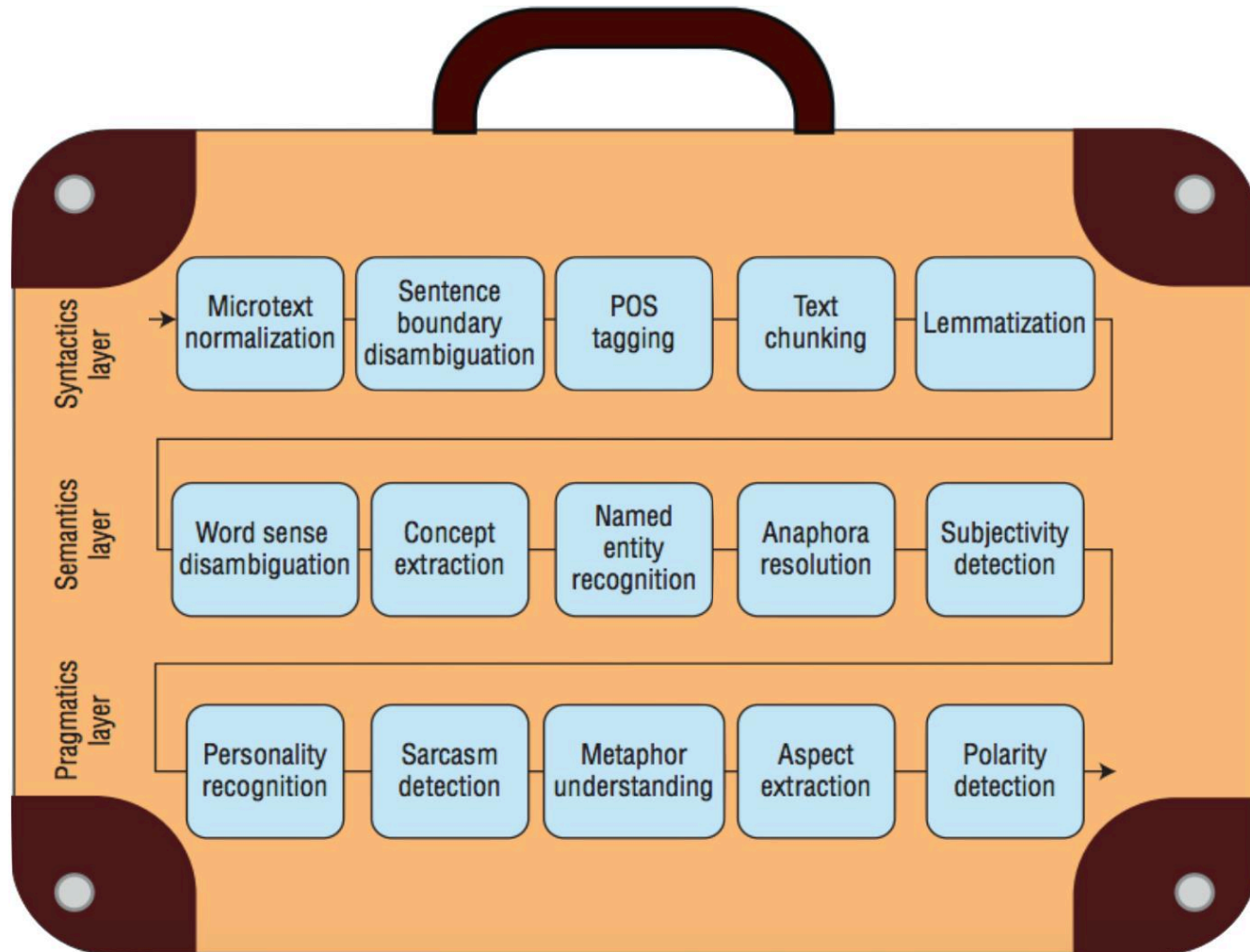


# 7 Pillars for the Future of AI



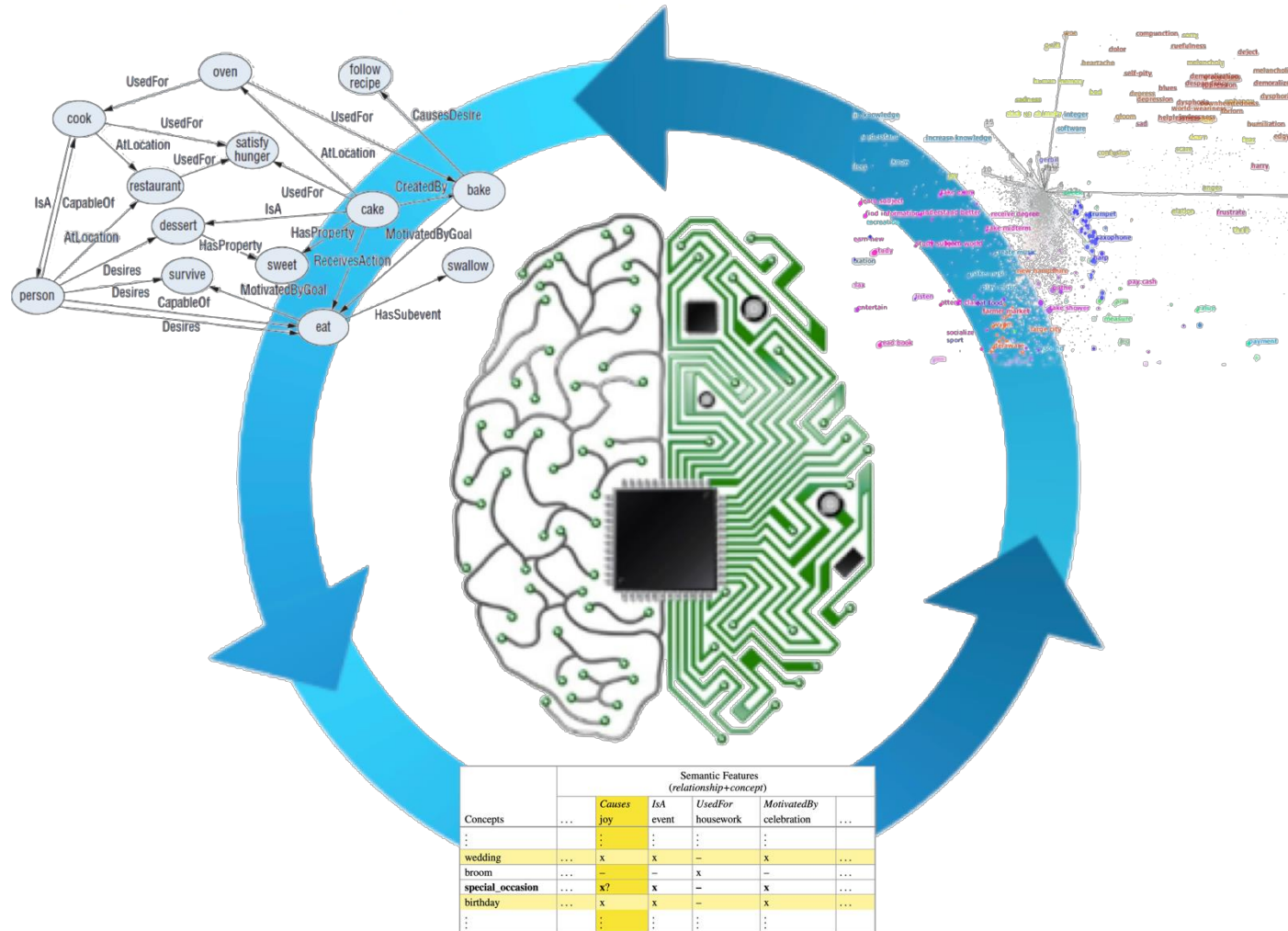


# Task Decomposition II



*E Cambria, S Poria, A Gelbukh, M Theilwall. Sentiment Analysis is a Big Suitcase. IEEE Intelligent Systems 32(6), 74-80 (2017)*

# Parallel Analogy



E Cambria, D Olsher, K Kwok. Sentic Activation: A Two-Level Affective Common Sense Reasoning Framework. Proceedings of AAI, 186-192 (2012)

# Symbol Grounding

IV



## Logic Definitions

1

$\nexists x \rightarrow \exists x = \text{GENERATE}(x)$

$\exists x \rightarrow \nexists x = \text{TERMINATE}(x)$

## Level-0 Primitives (Superprimitives)

2

**GENERATE** = create, produce, build, ...

**TERMINATE** = stop, halt, quit, end, ...

## Level-1 Primitives

3

**ACTIVATE** = GENERATE (PROCESS)  
Initiate, trigger, start, turn\_on, ...

**DEACTIVATE** = TERMINATE (PROCESS)  
switch\_off, shut\_down, unplug, ...

## Level-2 Primitives

4

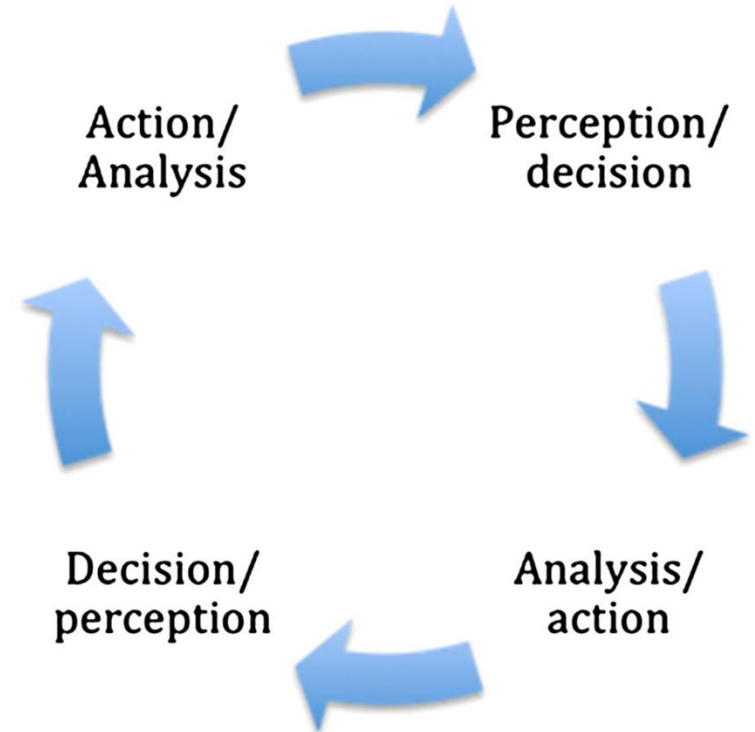
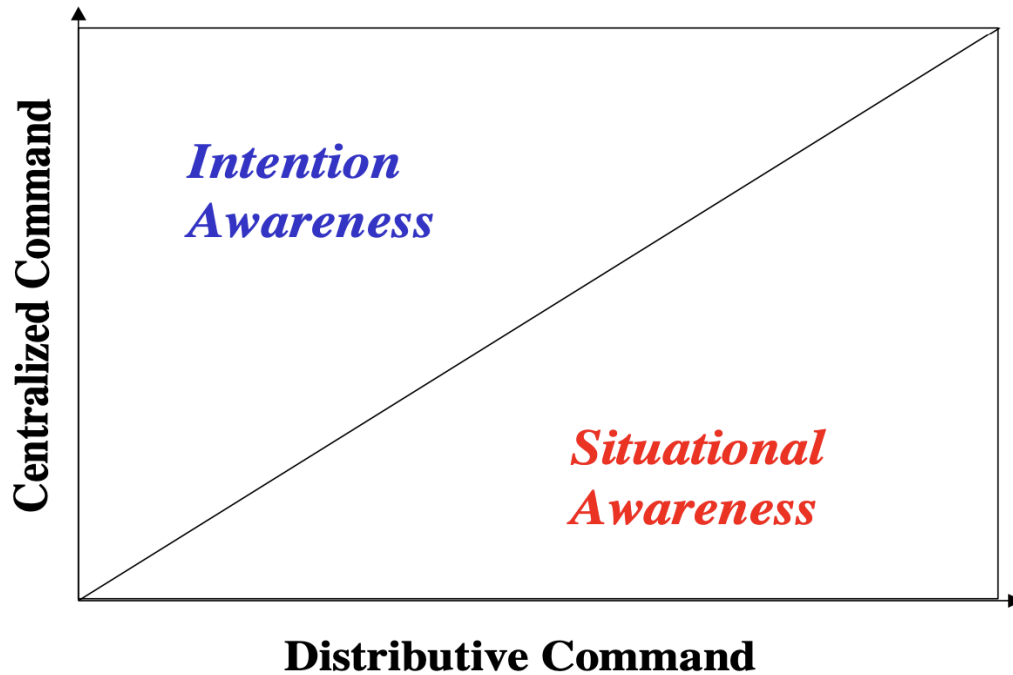
**BIRTH** = ACTIVATE (LIFE)  
beget, bring\_into\_the\_world, ...

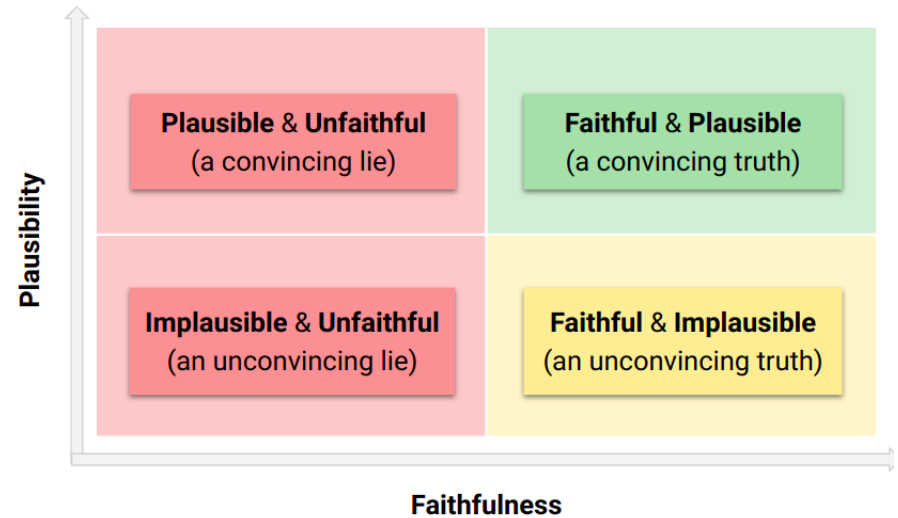
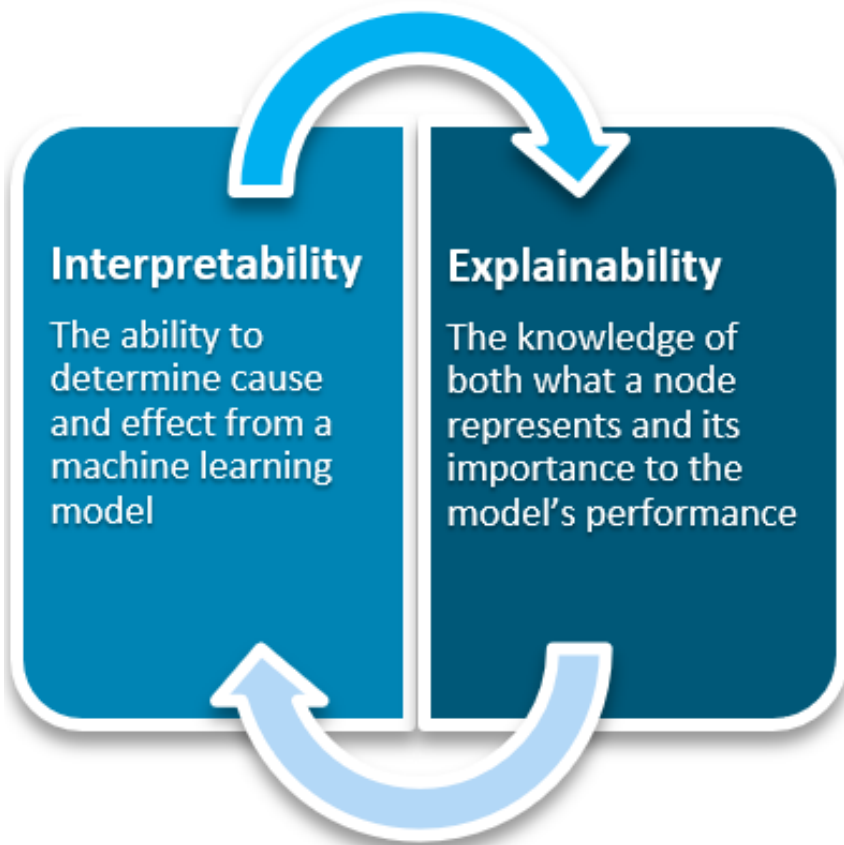
**MURDER** = DEACTIVATE (LIFE)  
kill, assassinate, homicide, slay, ...





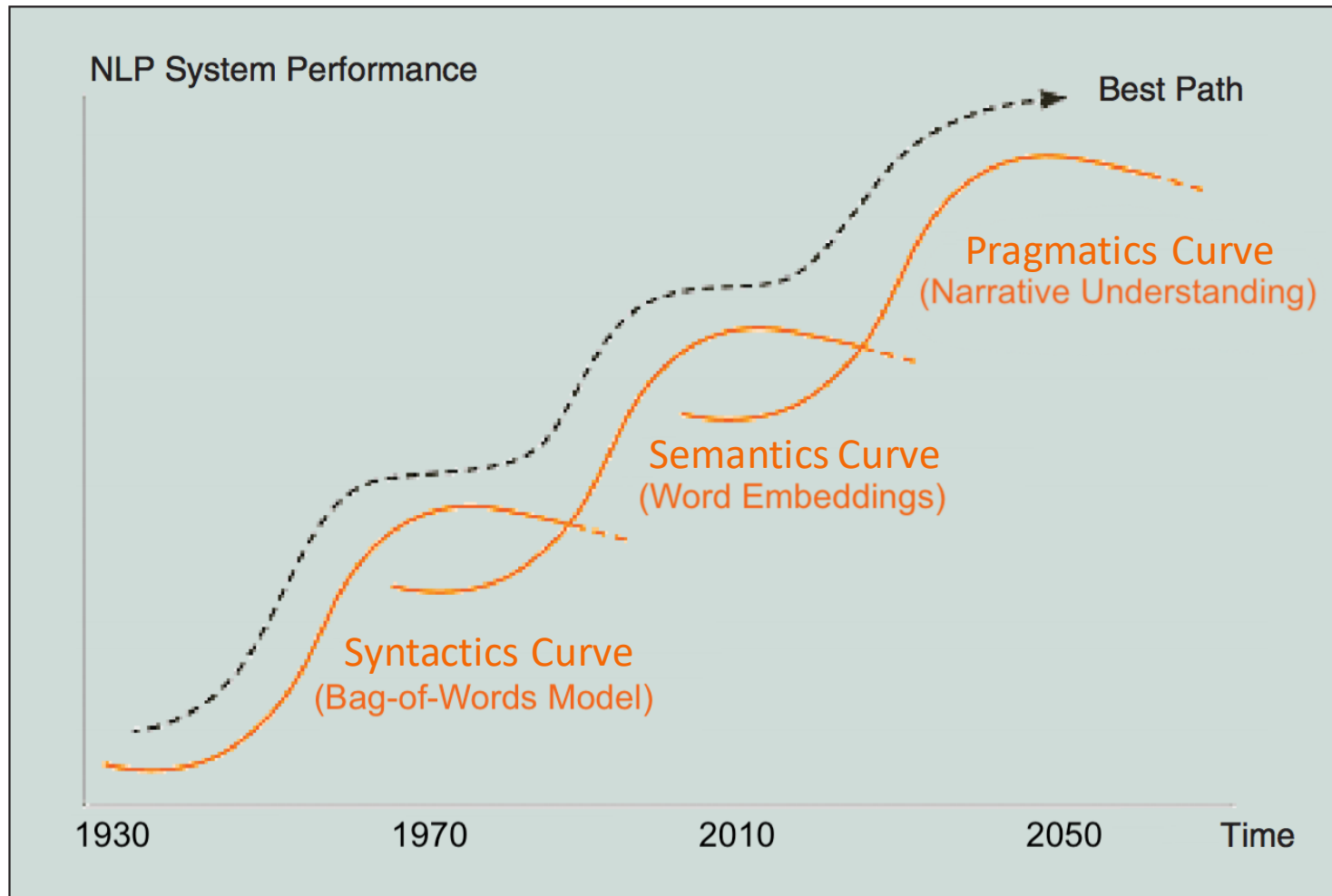
## Command Balance





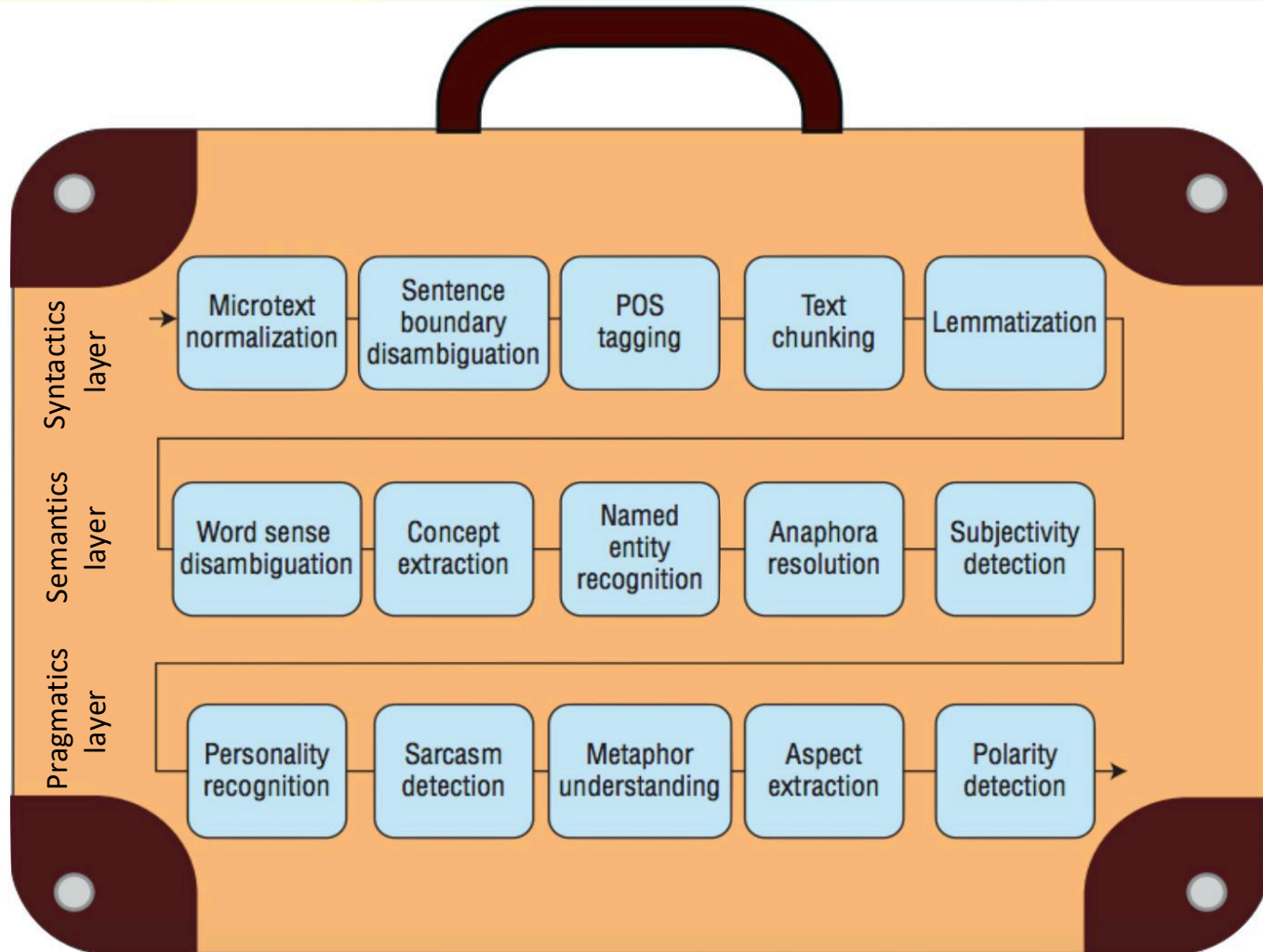


# Research roadmap



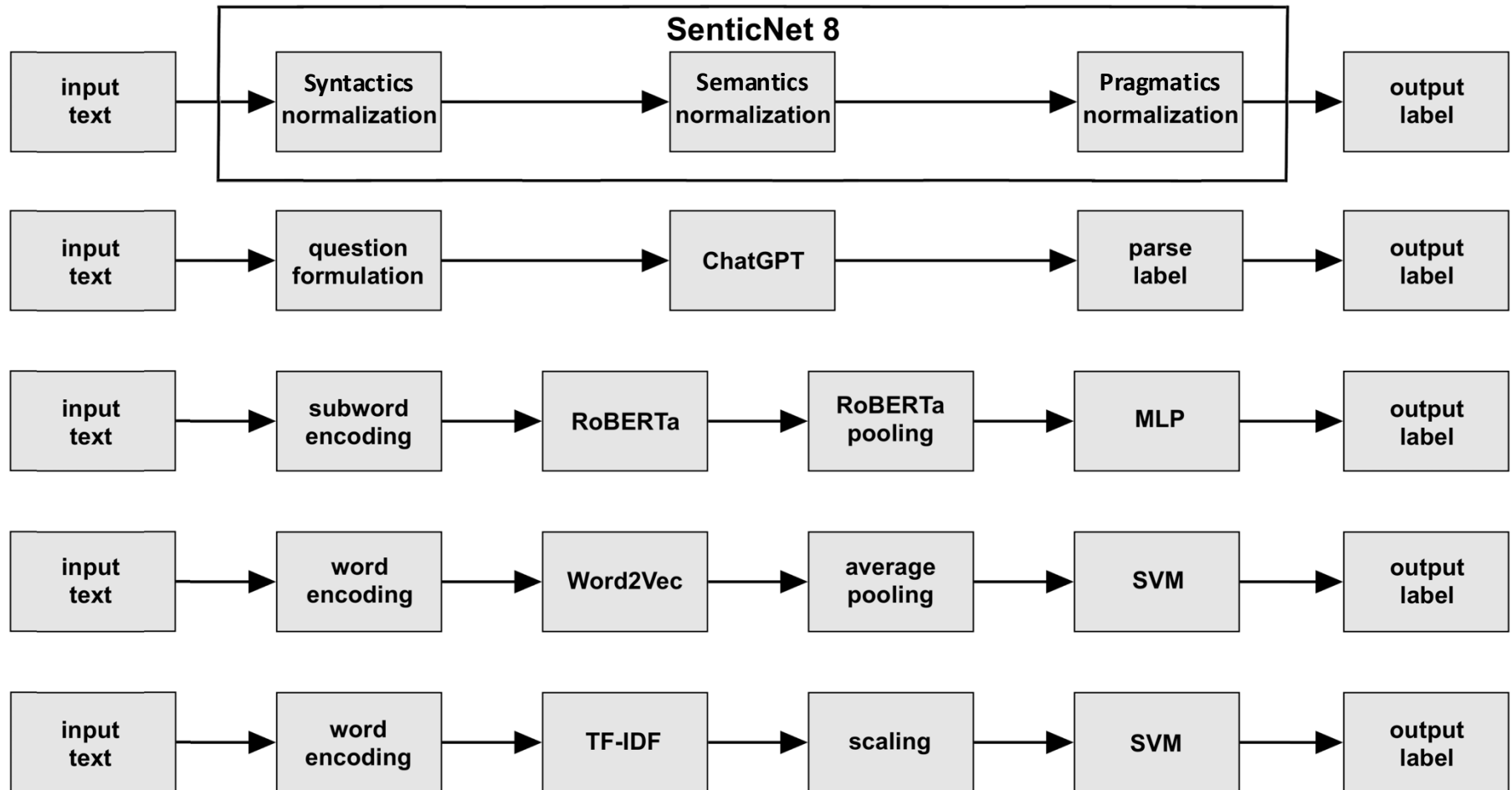
*E Cambria, B White. Jumping NLP Curves: A Review of Natural Language Processing Research. IEEE Computational Intelligence Magazine 9(2), 48-57 (2014)*

# Task Decomposition



*E Cambria, S Poria, A Gelbukh, M Thelwall. Sentiment Analysis is a Big Suitcase. IEEE Intelligent Systems 32(6), 74-80 (2017)*

# SenticNet 8



*E Cambria et al. SenticNet 8: Fusing Emotion AI and Commonsense AI for Interpretable, Trustworthy, and Explainable Affective Computing. Submitted to AAAI (2024)*

# Knowledge Representation for Conceptual, Motivational and Affective Processes



Dr Seng-Beng Ho is currently a Senior Scientist at the Institute of High Performance Computing (IHPC), A\*STAR, Singapore, conducting research on AI. He obtained his Ph.D. in Cognitive Science (AI, Neuroscience, Psychology, and Linguistics) and M.Sc. in Computer Science from the University of Wisconsin, Madison, U.S.A. He has a B.E. in Electronic Engineering from the University of Western Australia. He has published a number of AI-related papers in international journals and conferences over the years and he is the author of a monograph published in June 2016 by Springer International entitled “Principles of Noology: Toward a Theory and Science of Intelligence”. In the book, he presents a principled and fundamental theoretical framework that is critical for building truly general AI systems. For 11 years, he was President of E-Book Systems Pte Ltd, a company he founded that developed and marketed a novel 3D page-flipping interface for electronic books, with offices in the Silicon Valley, Beijing, Tokyo, Germany, and Singapore. He holds 36 U.S. and world-wide patents related to e-book technology. He has also lectured at the National University of Singapore on AI and Cognitive Science

