The 2nd Workshop on Analogical Abstraction in Cognition, Perception, and Language (Analogy-Angle II)

Proceedings of the Workshop

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Preface by the Workshop Chairs

Welcome to the 2nd edition of the Workshop on Analogical Abstraction in Cognition, Perception, and Language (Analogy-Angle II)!

Analogical abstraction is a fundamental human cognitive skill (Penn et al. 2008) (Penn et al. 2008; Hofstadter 2001) defined as the ability to perceive and utilize the similarities between concepts, situations, or events based on (systems of) relations rather than surface similarities (Holyoak 2012; Gentner and Smith 2012). Analogy enables creative inferences, explanations, and generalization of knowledge and has been used for scientific inventions (Dunbar 2012), solving problems (Gick and Holyoak 1980), and policy-making Houghton 1998. As such, it has been the subject of cognitive theories and studies about humans for standard processes, such as retrieving memories (Wharton et al. 1994) and problem-solving (Gick and Holyoak 1980).

Analogical tasks have gained considerable popularity in natural language processing (NLP) and artificial intelligence (AI), where they are often framed as tests of a model's intelligence in comparison to human performance. These tasks typically involve so-called word-based proportional analogies of the form (A : B :: C : D).(Mikolov et al. 2013a; https://arxiv.org/pdf/1301.3781; Gladkova et al. 2016; Ushio et al. 2021) lend themselves well to large language models (LLMs) (Webb et al. 2023). However, controlling for association and memorization (Stevenson et al. 2023; Lewis and Mitchell 2024) or shifting toward more complex settings like narratives reveals limitations in scope, generalizability, and alignment with cognitive theories (Nagarajah et al. 2022; Wijesiriwardene et al. 2023; Sourati et al. 2024).

Inspired by the richness of analogical abstraction and the wide interest in this topic from computational linguistics, artificial intelligence, and cognitive psychology, ANALOGY-ANGLE II connects these communities and facilitates cross-disciplinary activities. ANALOGY-ANGLE II welcomes novel contributions in short, long, and review formats, as well as relevant papers accepted at top-tier venues over the past year (so-called *dissemination papers*).

Topics of interest   belong to four major categories:

1. Cognitive modeling,   with the following sub-topics: analogy and abstraction; relation to conceptual metaphor, figurative language, sarcasm, and irony; cognitive frameworks of analogy; and cognitive psychological studies on analogy involving human participants.

2. Algorithms and methods,   featuring the sub-topics: studies of the analogical abilities of LLMs and multimodal models; algorithmic approaches to analogy; augmentation and verification of LLMs and multimodal models through analogy; neuro-symbolic AI architectures for analogical abstraction; and extracting analogies from knowledge bases.

3. Tasks and benchmarks,   with sub-topics: matching narratives and situational descriptions through narratives; novel tasks and benchmarks for evaluating analogies in text and vision; analogy in longer formats, e.g., narratives and videos; analogy and visual abstraction tasks; and analogical discovery in computational creativity.

4. Applications   , such as: personalization, explanation, and collaboration; novel applications of analogical abstraction; studies of the impact of analogy in specific applications and domains, including education, innovation, and law.

ANALOGY-ANGLE II aims to form a comprehensive picture of the current landscape of analogical abstraction, and point to standing challenges, evaluation methodologies, and emerging techniques of interest. To this end, the workshop features two prominent speakers with complementary perspectives, and paper sessions that cover a wide range of the envisioned topics. The multidisciplinary nature of

ANALOGY-ANGLE II is supported by the broad skills of the organization team and the program committee, as well as the diversity principle guiding the list of topics and the invited keynotes. After a successful first workshop at IJCAI 2024, we see ACL as an ideal venue for our second iteration. ACL is a primary venue for cutting-edge research on analogy and abstraction, facilitating discussions with leaders at the intersection of natural language processing, cognitive linguistics, and perception.

We received 14 novel submissions. 10 of them were submitted via direct submission, and the remaining 4 through the ARR commitment. Based on three reviews per submission, we accepted 9 novel papers, resulting in an acceptance rate of 64%. Additionally, 3 non-archival, cross-submissions were accepted based on two reviews per paper, assessing their relevance.

We are deeply grateful to the members of the Program Committee for their dedicated efforts. Our sincere thanks also go to our invited speakers, Melanie Mitchell and Ekaterina Shutova, for their valuable and inspiring contributions to this year's program. We thank Melanie Mitchell for her talk on abstraction in humans and AI systems and Ekaterina Shutova for her talk on metaphors.

The Analogy-angle II 2025 Organizing Committee

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