Measuring Creativity - Workshop Proposal

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Keywords: creative cognition; creativity psychometrics; creative problem solving; computational modelling; computational creativity; creativity metrics and methods; intelligent systems; creativity assistive systems

Workshop Proposal

Various methods exist for measuring creativity, most of them in the form of creativity tests, like the Remote Associates Test [Mednick, 1962], the Alternative Uses Test [Guilford, 1956], TTCT [Kim, 2006], the Wallach-Kogan tests [Wallach and Kogan, 1965], insight problems [Maier, 1931, Duncker, 1945, Cunningham et al., 2009], etc.

However, the feasibility and dependability of various types of psychometric assessment and administration of measures, as pertaining to various creativity tasks, have recently been questioned and enriched [Beisemann et al., 2018, Hass, 2015, Hass et al., 2018, Hass and Beaty, 2018, Wilken et al., 2018]. The thought and work on the measurement of creativity are witnessing a new revival.

Recently, new methods of computationally creating stimuli for greater measurement accuracy have been developed [Olteţeanu et al., 2017, Olteţeanu, 2016, Olteteanu and Yoopoo, 2017], inspired by artificial cognitive systems that solve creativity tests [Olteţeanu et al., 2018]. Such computational psychometrics methods have already shown to provide designs with greater control [Olteţeanu and Schultheis, 2017] and the computational resurrection of tests which were initially proposed theoretically [Olteţeanu et al., 2018].

This workshop will focus on building a red thread of discussion on the current state of creativity psychometrics, integrating topics on existing classic and novel, manual and computational methods of testing and measuring creativity. The following questions will be addressed:

(i) What creativity measuring methods exist and what are their strengths and weaknesses?

(ii) Which creativity factors are measured by the existing creativity methods? Is there an overlap of measuring methods for different factors? Are they factors for which no methods exist or current methods are not yet up to the task?

(iii) What is the suitability of existing current methods for empirical testing versus computational modelling?

(iv) How can comparability be ensured across creativity test item sets?

(v) What creativity metrics and methods can be used in evaluating the computational modeling of creativity?

(vi) What is the impact of artificial cognitive systems and their evalution on creativity metrics? Of computational creativity systems and their evaluation?

(vii) What are the new computational and automatized measures of creativity, and what is their role in the ecosystem of measures?

(viii) Subjective and objective measures in creativity.

Workshop Duration and Organization

We propose a half a day workshop for the presentation, discussion and elaboration of creativity measuring methods. The workshop will involve three elements:

(i) Three invited speakers from different backgrounds (Cognitive Psychology, Cognitive Neuroscience, Cognitive Systems - Computer Science) will present existing creativity measuring methods (details below).

(ii) Short presentations of papers and posters will be accepted on the topic.

(iii) The workshop will end with a panel discussion, focused on establishing future directions for methods and systems aimed at supporting creativity and problem solving.

Publication: The papers submitted for this workshop will be published as a CEUR-WS volume. If enough high quality papers are received, a Special Issue will be proposed by the organizer to the *Cognitive Systems Research* journal, or a topic proposal will be made to TopiCS in Cognitive Science.

Topics for this workshop will be centered around, but not limited to:

- Creative cognition
- Creativity measures and Tests
- Psychometrics for Creative Cognition
- Computational methods for measuring creative cognition
- Computational modelling
- Artificial creative cognitive systems
- Creative problem solving
- Computational Creativity
- Evaluation of natural and computational cognitive systems
- Associativity and Conceptual Spaces
- Semantic networks and semantic graphs
- Ill structured problem solving and Structured representations
- Knowledge discovery
- Creativity modeling approaches and their relation to evaluation, including Case based reasoning, Neural networks, Evolutionary algorithms
- Analogy and Metaphor
- Creative assistive systems

Speakers

- **Richard Hass** – Thomas Jefferson University, US. Talk topic: *Improving Measures on Creative Object Uses*. Background: Cognitive Psychology.

- **Evangelia Chrysikou** – Drexel University, US. Talk topic: *A standardized test for creativity based on the Alternative Uses Task*. Background: Cognitive Neuroscience.

- **Ana-Maria Olteţeanu** – Head of Cognitive Systems, Freie Universitat Berlin– Talk topic: *Computational Measures of Creativity*. Background: Cognitive Systems – Computer Science.

Organizer - Short biography

Ana-Maria Olteţeanu is the Principal Investigator of the „Creative problem solving in cognitive systems" (CreaCogs) project funded by the German Research Foundation (DFG) at the Freie Universitat Berlin, Germany.

Ana-Maria has a cross-disciplinary background: she holds a PhD in Musicology (2011) and a *summa cum laude* Doctorate in Cognitive Systems and Artificial Intelligence (2016). Her thesis got nominated for the EurAI Dissertation Prize, and won the OLB 1st Prize for the best Doctoral Dissertation in Science in NW Germany in the last two years (2017).

Ana-Maria authored more than 30 papers on the topic of creative problem solving, of which five journal articles focus on developing artificial cognitive systems and computational measures for creativity psychometrics. Her book *Cogs in the Creative Machine* will be published by Springer in June 2019. Ana-Maria has reviewed more than 40 papers for over 20 international conferences and journals, and gave over 20 conference and invited talks on creative cognitive systems. Dr. Dr. Olteţeanu has been a program committee member of 15 workshops and conferences in the field. She organized and chaired 4 Symposia/Workshops/conference tracks, and is the editor of four volumes and special issues on creativity related topics. Together with Sebastien Helie, Ana-Maria will write the chapter on *Computational Models of Creativity* in the upcoming edition of The Cambridge Handbook of Computational Cognitive Sciences. Ana-Maria's interests are related to natural and artificial cognitive systems, creative problem solving, cognitive modeling, computational psychometrics, knowledge discovery and spatial reasoning.

Recent Organizing and Editorial Experience

2018 - 2021 – Editorial Board member, Cognitive Systems Research Journal.

2018 – Organizer and Chair of the workshop *Computational Methods and Systems for the Cognitive Modelling and Support of Creativity and Creative Problem Solving*, at the Cognitive Science Conference in Madison, Wisconsin, 2018 (over 50 participants)

2018-2019 – Topic Editor for *Frontiers in Psychology-Cognitive Science* and *Frontiers in Artificial Intelligence and Robotics*, for the Topic *Creativity from Multiple Cognitive Science Perspectives* (with Bipin Indurkhya).

2018-2019 – Guest Associate Editor for *Frontiers in Psychology-Cognitive Science* and *Frontiers in Artificial Intelligence and Robotics*, for the Topic *Creativity from Multiple Cognitive Science Perspectives* (with Bipin Indurkhya).

2017-2018 – Guest editor of the Cognitive Systems Research journal, for the special issue on *Problem-solving, Creativity and Spatial Reasoning in Cognitive Systems* (with Zoe Falomir).

2017 – Editor of the *Proceedings of the 2nd Symposium on Problem-solving, Creativity and Spatial Reasoning in Cognitive Systems*, CEUR-Ws vol. 1869 (with Zoe Falomir).

2017 – Co-organized the *ProSocrates - Problem solving, creativity and spatial reasoning in cognitive systems* Symposium, at the Hanse Wissenschafts-Kolleg, Delmenhorst, Germany.

2016 – Co-organized the *ProSocrates - Problem solving, creativity and spatial reasoning in cognitive systems* Symposium, at the German Cognitive Science Society conference - Space for Cognition, Bremen (Germany).

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