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—Commentaries and Author’s Response

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## Introduction to the JAGI Special Issue “On Defining Artificial Intelligence” —Commentaries and Author’s Response

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Pei Wang’s paper titled “On Defining Artificial Intelligence” was published in a special issue of the Journal of Artificial General Intelligence (JAGI) in December of last year (Wang, 2019). Wang has been at the forefront of AGI research for over two decades. His non-axiomatic approach to reasoning has stood as a singular example of what may lie beyond narrow AI, garnering interest from NASA and Cisco, among others. We consider his article one of the strongest attempts, since the beginning of the field, to address the long-standing lack of consensus for how to define the field and topic of artificial intelligence (AI). In the recent AGISI survey on defining intelligence (Monett and Lewis, 2018), Pei Wang’s definition,

*The essence of intelligence is the principle of adapting to the environment while working with insufficient knowledge and resources. Accordingly, an intelligent system should rely on finite processing capacity, work in real time, open to unexpected tasks, and learn from experience. This working definition interprets “intelligence” as a form of “relative rationality” (Wang, 2008),*

was the most agreed-upon definition of artificial intelligence with more than 58.6% of positive (“strongly agree” or “agree”) agreement by the respondents ( $N=567$ ).

Due to the greatly increased public interest in the subject, and a sustained lack of consensus on definitions for AI, the editors of the Journal of Artificial General Intelligence decided to organize a special issue dedicated to its definition, using the target-commentaries-response format. The goal of this special issue of the JAGI is to present the commentaries to (Wang, 2019) that were received together with the response by Pei Wang to them.

A total of 110 leading experts (31.8% female, 68.2% male) were invited to contribute with commentaries to the target article. The criteria for selection considered a conjunction of research in AI and AGI related topics, scientific work on defining AI as a field or as a concept, (co-)authorship of international and national AI-related reports, (co-)authorship of books on AI, as well as chair activities in major AI conferences, among other criteria.

More than 1300 email messages including invitations, several follow-ups and reminders per invited expert, as well as organisational emails exchanged in all phases of the editorial process, were sent. The deadline for submission was extended several times upon some authors requests.

42 experts (38.2%) rejected the invitations explicitly. 48 experts (43.6%) didn't respond to our call.<sup>1</sup> Other general statistics are presented in Table 1.

Invites ...	No.	Female		Male		Total
		% of total	% of female	% of total	% of male	
... sent	110	35		75		110
		31.8	100.0	68.2	100.0	100.0%
... accepted	20	0		20		20
		0.0	0.0	18.2	26.7	18.2%
... rejected	42	16		26		42
		14.5	45.7	23.6	34.7	38.2%
... with no answer back	48	19		29		48
		17.3	54.3	26.4	38.7	43.6%

Table 1: Some general statistics of the editorial process regarding invitations to contribute.

We received twenty commentaries, those by Joscha Bach, Gianluca Baldassarre and Giovanni Granato, Istvan Berkeley, Francois Chollet, Matthew Crosby and Henry Shevlin, John Fox, John Laird, Shane Legg, Peter Lindes, Tomas Mikolov, William J. Rapaport, Raúl Rojas, Marek Rosa, Roger C. Schank, Aaron Sloman, Peter Stone, Richard S. Sutton, Kristinn R. Thórisson, Alan Winfield, and Roman V. Yampolskiy. All commentaries were accepted after peer-review.

If the reader was expecting a consensus around defining AI, we are afraid we have to disappoint them. We have received many kinds of responses: commentators that don't agree with Pei Wang's definition and provide their own, those that don't consider we need new definitions at all, those that agree with Wang's but still provide a new definition of AI, as well as those that additionally prefer to comment about other topics they feel are also important. A very colored spectrum around defining the most important concept of the AI field!

The commentaries published in this special issue are grouped in four parts:

- **Part I** includes one introductory commentary by Kristinn R. Thórisson (2020) that addresses central aspects of the target article from the editors' point of view.
- **Part II** contains sixteenth invited peer commentaries (Bach, 2020; Baldassarre and Granato, 2020; Berkeley, 2020; Chollet, 2020; Crosby and Shevlin, 2020; Fox, 2020; Laird, 2020;

1. Most striking in these numbers is the glaring absence of female authors. A common reason among female academics for rejecting our invitation to contribute was *overcommitment*. As a community, we may want to think of new, different ways of engaging the full spectrum of AI practitioners if we value inclusion as an essential constituent of a healthy scientific growth. Self determination and willingness to participate are also essential.

Legg, 2020; Lindes, 2020; Mikolov, 2020; Rapaport, 2020; Rojas, 2020; Rosa, 2020; Stone, 2020; Sutton, 2020; Yampolskiy, 2020) that address the target article explicitly, alphabetically ordered with respect to the surname of their first contributors.

- **Part III** continues with Pei Wang’s response (Wang, 2020) to those invited commentaries that are included in Part II.
- **Part IV** finishes this especial issue of the JAGI. It presents other three invited peer commentaries (Schank, 2020; Sloman, 2020; Winfield, 2020) that address other general topics related to the target article, like defining artificial intelligence, but that do not necessarily refer to it explicitly.

We are convinced that a variety of opinions on defining AI, especially as seen through the spectacles of a group of leading AI authorities, will be remarkably influential both for the field and for defining machine intelligence.

We trust that this special issue of the JAGI will become a transcending referent on defining AI and that, in Pei Wang’s words (Wang, 2020), it will constitute the beginning, not the ending, of that discussion.

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