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I'd like to briefly introduce myself. I am Giuseppe De Giacomo, full professor at Sapienza University of Rome. My main research area is Knowledge Representation, although I contributed to several other areas of AI and CS. I am an ECCAI Fellow since 2002, and an AAAI and ACM Fellow since 2016. My full list of publications can be found on DBLP (http://dblp.uni-trier.de/pers/hd/g/Giacomo:Giuseppe_De), and my bibliometrics on Google Scholar (https://scholar.google.com/citations?user=Sfo4K0oAAAAJ&hl=en)

One of my main interests is Reasoning about Action and forms of Generalized Planning. This is the area on which I am recently collaborating with Sasha Rubin, and I am trilled to be asked for a recommendation letter for him, who I consider one of the best young researchers I have been interacting with lately.

Sasha Rubin is an internationally highly regarded researcher in Formal Methods that has developed a profound interest in Artificial Intelligence in the last years. More precisely Sasha Rubin has done excellent research in several areas of Formal Method, including automatic structures and algorithmic model theory based, parametric model checking and synthesis, topological structures, game theoretic characterizations of multi parties, strategic reasoning with incomplete and imperfect information. His work has been published in top conferences in formal methods such as LICS (4), STACS (3), LPAR (2), CONCUR (1), CAV (1), ICALP (1), IJCAR (1) and in top journals such as Information and Computation (1), Journal of Automata, Languages and Combinatorics (2), Bulletin of Symbolic Logic (1), Logical Methods in Computer Science (1), SIGACT News (1) ACM Transaction on Computational Logic (1), Theoretical Computer Science (1). He also coauthor of the well-known recent book on parametrized verification:

- Roderick Bloem, Swen Jacobs, Ayrat Khalimov, Igor Konnov, Sasha Rubin, Helmut Veith, Josef Widder: Decidability of Parameterized Verification. Synthesis Lectures on

Distributed Computing Theory, Morgan & Claypool Publishers 2015.

His interest in AI has started with the realization that multi-agent systems may need a quite advanced formal analysis and that his knowledge put him in a special position to contribute to such an analysis. This has led to publications in top AI conferences:

- Francesco Belardinelli, Alessio Lomuscio, Aniello Murano, Sasha Rubin: Verification of Broadcasting Multi-Agent Systems against an Epistemic Strategy Logic. IJCAI 2017.

- Julian Gutierrez, Aniello Murano, Giuseppe Perelli, Sasha Rubin, Michael Wooldridge: Nash Equilibria in Concurrent Games with Lexicographic Preferences. IJCAI 2017.

- Francesco Belardinelli, Alessio Lomuscio, Aniello Murano, Sasha Rubin: Verification of Multi-agent Systems with Imperfect Information and Public Actions. AAMAS 2017: 1268-1276

- Benjamin Aminof, Vadim Malvone, Aniello Murano, Sasha Rubin: Graded Strategy Logic: Reasoning about Uniqueness of Nash Equilibria. AAMAS 2016.

- Benjamin Aminof, Aniello Murano, Sasha Rubin, Florian Zuleger: Automatic Verification of Multi-Agent Systems in Parameterised Grid-Environments. AAMAS 2016.

- Benjamin Aminof, Aniello Murano, Sasha Rubin, Florian Zuleger: Prompt Alternating-Time Epistemic Logics. KR 2016.

- Sasha Rubin: Parameterised Verification of Autonomous Mobile-Agents in Static but Unknown Environments. AAMAS 2015.

- Sasha Rubin, Florian Zuleger, Aniello Murano, Benjamin Aminof: Verification of Asynchronous Mobile-Robots in Partially-Known Environments. PRIMA 2015.

- Aniello Murano, Giuseppe Perelli, Sasha Rubin: Multi-agent Path Planning in Known Dynamic Environments. PRIMA 2015. *Best paper prize.*

During this work on multiagent systems he started getting attracted to generalized forms of planning and reasoning about actions. Because of this interest, Aniello Murano introduced Sasha Rubin to me in late 2015. This lead immediately to some quite interesting work, some of it already published, but much of it still ongoing:

- Blai Bonet, Giuseppe De Giacomo, Hector Geffner, Sasha Rubin: Generalized Planning: Non-Deterministic Abstractions and Trajectory Constraints. IJCAI 2017.

- Giuseppe De Giacomo, Aniello Murano, Sasha Rubin, Antonio Di Stasio: Imperfect-Information Games and Generalized Planning. IJCAI 2016.

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Generally speaking working with Sasha Rubin is easy and enjoyable. He is very cooperative, competent, and generous in his efforts. His way to approach a problem facilitates thinking and

encourages generating new ideas. Often he is able to pin down critical issues, explain them in a clear and precise way, and provide suggestive examples taken from reality. In doing research his strong background in formal methods, logic, and computer science, allows him to master difficult problems and to devise effective conceptual frameworks to address them. The discussion of technical topics with him is always a pleasure, because Sasha Rubin is enthusiastic, very knowledgeable, fast thinking, creative and able to find weak spots of an argument almost immediately, providing viable alternatives. I would like to stress that in several occasions, he has turned his coauthors intuitions totally upside down reaching unexpected interesting conclusions. Also I'd like to emphasize his technical abilities: he showed in his work with me that he is able to formalize intuitions mathematically and to prove difficult results using quite advanced arguments.

He has generously served the scientific community at various level of responsibility. By the way, this february, he organized a workshop by invitation only at the University of Naples in Formal Methods, which attracted interest of prime scientists in both fields, including AI researchers such as Hector Geffner, Mike Wooldridge, and Michael Fisher (`https://sites.google.com/site/fmai2017homepage/home`).

His presentations at scientific meetings are always outstanding: notably he can present technically quite advanced topics in a very clear, and concise way, while, at the same time, putting forward the key intuitions in a compelling and attractive fashion.

Overall, I believe that Sasha Rubin is one of the best researchers currently working for bridging the areas of formal methods and in artificial intelligence, thanks to his very strong background in formal methods and his openness ideas coming from other fields. These characteristics, are complemented by his enthusiasm, cooperative attitude, and creativity. Sasha Rubin is also a very nice person; he is friendly, caring and reliable, as he definitely demonstrated to me, and he takes responsibilities very seriously.

Given his outstanding record and merits, I recommend in the strongest terms Sasha Rubin for a position as a RTD A at the University of Naples "Federico II".

Yours sincerely,

Giuseppe De Giacomo