Academic Corner
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In this issue, we interview our IEEE SMC member Giuseppe D'Aniello. Giuseppe is an Associate Professor of Computer Engineering at the University of Salerno, Italy. He earned his Ph.D. in Information Engineering in 2018. He has been project manager and senior researcher at the CORISA (Research Consortium on Agent Systems), coordinating research projects on situation awareness and decision support systems. In 2019, he has been a visiting researcher at the University of Twente, the Netherlands. His research interests include situation awareness, cyber-physical-social systems, computational intelligence, and their applications in domains such as logistics, e-learning, and smart cities. He is a member of the Editorial Boards of IEEE Transactions on Human-Machine Systems, and Journal of Cognitive Computation (Springer). Giuseppe is a Senior Member of IEEE, Chair of the IEEE SMC Distinguished Lecturers Program Subcommittee, and Vice-Chair of both the IEEE SMC Italy Chapter and the IEEE SMCS Technical Committee on Cognitive Situation Management. He has also served in various roles at IEEE conferences such as SMC, HMS, and CogSIMA. In 2025, he co-founded UrbanMIS, a University of Salerno spin-off specialized in situation awareness solutions for city management and digital marketing advertising.

(1) Please tell us a bit about your research. What inspired you to follow this field?
My research focuses on methodologies and computational approaches to enhance Situation Awareness (SA) in cyber-physical-social systems. In simple terms, situation awareness is the ability to perceive what is happening, interpret its meaning, and anticipate how it may evolve—so that both humans and artificial agents can make better decisions. To this end, my work explores cognitive models, human factors, computational and artificial intelligence techniques, and intelligent human–machine systems, with applications in logistics, e-learning, smart cities, and wearable devices.
My passion for this area began during my Master's studies and grew throughout my Ph.D. In those years, I was fortunate to combine academic research with part-time work in two prestigious research centers. This experience gave me the chance to face real-world problems and work in multidisciplinary teams, which was particularly inspiring. It was in this context, through one of my first projects, that I encountered the concept of situation awareness. I was immediately fascinated by how it integrates computer science, artificial intelligence, and human factors to design systems that help people understand complex contexts and make better decisions under constraints.
Over time, I realized that this vision is perfectly aligned with the spirit of the IEEE Systems, Man, and Cybernetics Society, which unites the system perspective, the cyber dimension, and the human component. For me, situation awareness is the key to developing intelligent agents and systems—because, after all, how can we truly call a system intelligent if it cannot deeply understand what is happening around it?

(2) Are there any underexplored opportunities that you find particularly exciting in this field? Where do you see the field going in the next 5-10 years?
Although significant progress has been made in recent years by the situation awareness community—which is not very large but certainly very active—many opportunities remain underexplored. I often like to distinguish between Human Situation Awareness and Computer Situation Awareness. Human SA is a well-established concept, but when we shift to artificial agents, the challenge becomes how to give them a comparable ability to perceive, interpret, and project situations. This is not only a fascinating research problem, but also a foundational element of truly intelligent systems.
From the computer science perspective, one of the central issues is situation representation. Existing approaches—ontologies, formal methods, or machine learning—are functional but limited. The real

challenge is to develop models that are lightweight, powerful, and above all trustworthy: explainable, transparent, and reliable, so that both humans and artificial agents can build confidence in the same shared understanding. Much of today's research focuses on large language models and generative AI copilots, which show impressive capabilities in language and reasoning. Yet without trustworthy situation awareness, their intelligence remains incomplete—it is like having a brilliant speaker who can talk endlessly, but with no awareness of the room they are in.

Looking ahead, I believe that the next decade will bring important advances in this direction. The combination of generative AI with explainability techniques could enable new forms of situation representation: formal enough for machines, but accessible and transparent for humans. This will be crucial for effective human–AI teaming, where trustworthy situation awareness ensures that both humans and machines can rely on the same interpretation before taking action. Advances in this area could also empower practical applications—for instance, digital twins that not only mirror real systems but also generate and anticipate evolving situations, enabling timely and effective responses.

In this sense, situation awareness will not only be the foundation of intelligent systems, but also a key enabler of safer, more sustainable, and more human-centered technologies for society. In my view, situation awareness will become to intelligent systems what perception is to humans: the foundation of meaningful intelligence.

(3) What advice would you give young researchers entering your field?

I usually tell younger researchers that passion is essential, but in a multidisciplinary field like ours, it is not enough. No one can master everything, which is why working in teams and connecting to a broad research network is crucial from the very beginning. Collaborating with others fills knowledge gaps and exposes you to new perspectives, and IEEE SMC is an excellent place to start building these connections.

It is also important to stay grounded in reality. Situation awareness is not just theoretical: it emerges when dealing with complex, real-world problems. Engaging with concrete applications—from security to healthcare or smart cities—will help you understand what challenges really matter and how your work can have an impact.

At the same time, nurture your curiosity but try to focus it. Start broad, explore different directions, then identify a question that truly excites you and work on it step by step. Think of research less as a race toward final answers and immediate results, and more as an ongoing process of discovery—where the value lies not only in the destination, but in the act of questioning and exploring along the way.

(4) What role has IEEE and IEEE SMC played in your career?

The Systems, Man, and Cybernetics Society has become the natural home for my research on situation awareness, because it connects systems, the cyber dimension, and the human perspective. Within SMC I have had the opportunity to take active roles in technical committees, conference organization, and initiatives such as the Distinguished Lecturers Program. I also feel that IEEE has concretely supported the advancement of my career. The awards and recognitions I received from the SMC Society were not only an honor but also a decisive encouragement that gave visibility to my work and opened new opportunities. These experiences, together with the chance to collaborate with passionate colleagues from all over the world, have been invaluable both for my research and for my personal growth.

(5) Any last words of advice?

My last advice would be never lose sight of the bigger picture: research is not just a job, but a way of building deeper understanding—of systems, of people, and of the situations around us. If you cultivate curiosity, collaborate openly, and engage with the community, you will discover that doing research is not only impactful, but also one of the most rewarding journeys you can take—and, for me, truly the best job in the world.