

# Self-Aware Autonomous Systems in Realistic Environments

Scientific interest and innovation potential of topic	
<ul style="list-style-type: none"> <li>• <i>Exploration of bold ideas for radically new technologies based on high-risk / high gain cutting-edge science</i></li> <li>• <i>Knowledge and communities from different disciplines brought together</i></li> <li>• <i>Research results can be transformed into innovations with societal or economic impact</i></li> </ul>	<b>Mark</b>
<p><b>Strong points</b>            The proposal addresses a very important and timely problem: Research on self-aware autonomous systems is highly relevant due to the need to develop systems that are accountable.</p> <p>Research on self-aware systems may foster innovations with societal and economic impact. To achieve this, an interdisciplinary approach is necessary.</p> <p>Novel approaches on self-aware autonomous systems are highly relevant to real-world industrial applications.</p> <p><b>Weak points</b>            The proposal does not deal with an entirely new topic. There was a DARPA workshop on "Self-Aware Machines" as early as 2004. The topic of self-awareness was well addressed in a 2017 book on Self-Aware Computing Systems by Kounev et al. The proposal does not refer to specific, radically new technologies.</p> <p>The description of the proposal is unclear and vague. It does not provide a clear definition of the term "self-awareness". The proposal mentions topics that have attracted much attention in AI research and have been addressed in other calls, including predictability, fault tolerance, efficiency, etc. However, the reference to self-awareness remains unclear. On the other hand, the proposal does not emphasize the properties of a self-aware computing system (self-reflective, self-predictive, and self-adaptive) that have been reported in the literature.</p> <p>The topic has the potential to bring together knowledge and communities from different disciplines. However, the proposal does not demonstrate the need for interdisciplinary work. In addition, areas that could advance the topic (e.g., social and cognitive sciences) are not adequately addressed.</p> <p><b>Comments</b>            Not really a new topic</p>	<b>3/5</b>

# Self-Aware Autonomous Systems in Realistic Environments

<b>Suitability for a CHIST-ERA call</b>	
<ul style="list-style-type: none"> <li>• <i>Added value of transnational cooperation in the framework of a joint call can (complementary national scientific strengths, critical mass, joint infrastructures, ...)</i></li> <li>• <i>Complementarity and/or redundancy with previous CHIST-ERA Calls</i></li> <li>• <i>Complementarity and/or leverages with other Calls (EIC Pathfinder, Horizon Europe, H2020, ERA-NETs, ...)them (the topic should not be redundant with other calls)</i></li> <li>• <i>Add value of a call of a few M€ and project of around 1M€ in te area</i></li> </ul>	<b>Mark</b>
<p>Strong points The proposal brings together robotics, autonomous agents and software engineering. There is certainly a critical mass.</p> <p>Weak points There is some overlap with previous calls: EIC Pathfinder challenge: Awareness inside, CHIST-ERA Beyond Autonomic Systems - the Challenge of Consciousness</p> <p>Comments Self-awareness is a topic that has been researched since nearly 20 years and addressed in many projects.</p>	<b>3/5</b>

<b>Recommendation</b>	
<p><i>Suggestions on the improvement and further elaboration of the topic</i></p> <p><i>How weak points of the topic can be addressed?</i></p>	
<p>The proposal needs to be more focused to avoid overlap with previous calls. The proposal needs to specify more clearly what definition of self-awareness it starts from. The involved disciplines should be specified more clearly.</p>	

# Robust and sustainable Industry 4.0 operations in critical applications

Scientific interest and innovation potential of topic	
<ul style="list-style-type: none"> <li>• <i>Exploration of bold ideas for radically new technologies based on high-risk / high gain cutting-edge science</i></li> <li>• <i>Knowledge and communities from different disciplines brought together</i></li> <li>• <i>Research results can be transformed into innovations with societal or economic impact</i></li> </ul>	Mark
<p>Strong points</p> <p>It is an interesting and relevant topic. This research theme is innovative in its application to industry.</p> <p>In this proposal the predication part is more developed, compared to intial proposal, with a focus on the real time aspects with sustainability and robustness as main goals.</p> <p>The main challenge is the production of efficient algorithms combining AI methods for predictions and optimization techniques. The proposal with such combinations can be innovative.</p> <p>Weak points</p> <p>It is not clear if the production of algorithms is based on new research questions and if it needs or not a strong cooperation with industry. The innovation from the theoretical point of view has to be clarified.</p> <p>The AI methods explored in this context could be more precise, for instance concerning big-data, machine learning or neuro-symbolic AI, in order to emphasize the challenges and research questions.</p> <p>Comments</p> <p>There is an evolution of the title that was “Prescriptive analytics for robust and sustainable Industry 4.0 operations” and that is now “Robust and sustainable Industry 4.0 operations in critical applications. The proposal proposes to use new prescriptive analytics techniques with a focus on their use for critical applications.</p>	<p><b>3/5</b></p>

# Robust and sustainable Industry 4.0 operations in critical applications

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<p>Strong points</p> <p>Transdisciplinarity is present in the project. Research in machine learning, AI techniques and optimization is developed across Europe in different sites and research institutions with various approaches and methodologies.</p> <p>Weak points</p> <p>The call targets scientists in the fields of predictive and prescriptive analytics at large, mainly machine learning and operational research specialists. But one has to be sure that, when reading the call, many proposers will confuse prescriptive analytics with simply optimization in operations research, which would be very reductive.</p> <p>Comments</p> <p>There are working groups focusing on the integration of machine learning with optimization. The applicability of the results and tools to Industry 4.0 critical processes, and the development of modeling and algorithmic tools must be central in the call in order to provide efficient prescriptive analytics tools in the context of Industry 4.0.</p>	<b>3/5</b>

# Robust and sustainable Industry 4.0 operations in critical applications

<b>Recommendation</b>	
<i>Suggestions on the improvement and further elaboration of the topic</i>	
<i>How weak points of the topic can be addressed?</i>	
<p>The challenge being the production of efficient algorithms combining AI methods for predictions and optimization techniques, the topic must insist on these combinations and on the related research questions. Then the innovation from the theoretical point of view has to be clarified.</p> <p>The AI methods and tools studied in this context could be more precise, for instance concerning for instance big-data, machine learning or neuro symbolic AI, with a focus on the challenges and research questions.</p>	

# Multidimensional Geographic Information Systems (4DGIS)

Scientific interest and innovation potential of topic	
<ul style="list-style-type: none"> <li>• <i>Exploration of bold ideas for radically new technologies based on high-risk / high gain cutting-edge science</i></li> <li>• <i>Knowledge and communities from different disciplines brought together</i></li> <li>• <i>Research results can be transformed into innovations with societal or economic impact</i></li> </ul>	<b>Mark</b>
<p>Strong points</p> <p>Wide applications for the foundational research efforts</p> <p>Improved answers to research questions around the relevant fields</p> <p>Very difficult complex hard scientific challenges, large impact is possible</p> <p>Geoscience implications could grow the community</p> <p>Weak points</p> <p>Scientific challenge of the research problem could be better defined</p> <p>Still the specific research inventions are still not described perfectly beyond the engineering aspects stated in the call.</p> <p>Perhaps a small community</p> <p>Comments</p> <p>Increase the description of the technical challenges facing the community and the possible scientific areas of discovery</p>	<b>4/5</b>

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<p><b>Strong points</b> The cross domain and cross borders align well to the CHIST-ERA call</p> <p><b>Weak points</b> Level of innovation is unclear</p> <p><b>Comments</b> Need to elaborate further compared to existing commercial platforms</p>	<b>3.5/5</b>

Recommendation	
<i>Suggestions on the improvement and further elaboration of the topic</i>	
<i>How weak points of the topic can be addressed?</i>	

# Multidimensional Geographic Information Systems (4DGIS)

# Integrating Sensing and Communication in Future Wireless Networks

<b>Scientific interest and innovation potential of topic</b>	
<ul style="list-style-type: none"> <li>• <i>Exploration of bold ideas for radically new technologies based on high-risk / high gain cutting-edge science</i></li> <li>• <i>Knowledge and communities from different disciplines brought together</i></li> <li>• <i>Research results can be transformed into innovations with societal or economic impact</i></li> </ul>	<b>Mark</b>
<p>Strong points</p> <ul style="list-style-type: none"> <li>• Important problem, with supporting evidence.</li> <li>• Collaboration is important.</li> </ul> <p>Weak points</p> <ul style="list-style-type: none"> <li>• The community addressed might be small.</li> <li>• The proposal does mention software, but does come across as mostly narrowly focused on hardware.</li> </ul> <p>Comments</p> <p>The scope was discussed. It should be further broadened to connect to IoT, and ideally also to other topics like network (function) virtualization, edge computing, AI, and sensing. The proposal does not seem to have been revised based on similar prior feedback.</p>	<b>3</b>

# Integrating Sensing and Communication in Future Wireless Networks

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<p>Strong points</p> <ul style="list-style-type: none"> <li>• The proposal brings together different communities.</li> <li>• The proposal also brings together academia and industry.</li> </ul> <p>Weak points</p> <ul style="list-style-type: none"> <li>• Its unclear whether the targeted problem area would get enough funding through this program.</li> <li>• There are other programs such as <a href="#">6G-SNS</a> that overlap with the present proposal.</li> <li>• There seems to be heavy investment in the US including from public funding and carrier network corporations, which makes it unclear whether a proposal of this type/size can make a dent.</li> </ul> <p>Comments</p> <p>Broadening or possibly modifying the scope to include more software (higher layers than PHY) can lead better distinction towards existing programs and funding efforts.</p>	<b>3</b>

# Integrating Sensing and Communication in Future Wireless Networks

<b>Recommendation</b>	
<i>Suggestions on the improvement and further elaboration of the topic</i>	
<i>How weak points of the topic can be addressed?</i>	
<p>Overall, the reviewers felt that the proposal appears to be too strongly on the hardware side, where major funding including in the private sector already is being administered. By broadening/changing the scope to include more software aspects/higher layers and/by better connecting to topics such as IoT, edge computing, and network (function) virtualization the proposal could further set itself apart from existing initiatives and reach a larger community.</p>	

# Intelligent Contracts for Digital Transformation Ecosystems

Scientific interest and innovation potential of topic	
<ul style="list-style-type: none"> <li>• <i>Exploration of bold ideas for radically new technologies based on high-risk / high gain cutting-edge science</i></li> <li>• <i>Knowledge and communities from different disciplines brought together</i></li> <li>• <i>Research results can be transformed into innovations with societal or economic impact</i></li> </ul>	<b>Mark</b>
<p>Strong points</p> <ul style="list-style-type: none"> <li>• Digital transformation and digitization are highly relevant.</li> <li>• It seems clear that an electronic form of contract such as intelligent contracts is necessary for progressing in many areas.</li> <li>• Adaptation of contracts also seems necessary, with the software reacting to the contract. Even just different deployments of same service chains in different countries may need adaptation due to local legislation.</li> <li>• There is need for different communities to come together indeed to tackle the problem.</li> </ul> <p>Weak points</p> <ul style="list-style-type: none"> <li>• Security is probably another area that should be involved.</li> <li>• Smart contracts and blockchain are only mentioned/included at a relatively high level despite the strong connections.</li> <li>• Formal methods is another field which can contribute and is connected.</li> <li>• Data management is likely also relevant.</li> </ul> <p>Comments</p> <p>Scope was a larger part of the discussion. Some reviewers felt that the focus was too strongly on government or smart cities and could be widened more explicitly to the private sector. Others felt that government was the right and best target. Possibly mentioning that the private sector can benefit from the findings would strike the right balance. Another point of contention was to what extent legal aspects need to be addressed vs software and systems. The consensus seems to be that existing projects cover the legal aspects already, and the focus should indeed be on the latter aspects, although differences in legal systems between countries need to be acknowledged and considered.</p>	<b>4/5</b>

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<p>Strong points</p> <ul style="list-style-type: none"> <li>• The topic has the right “size”.</li> <li>• The topic does need collaboration between areas.</li> <li>• The topic also requires transnational interaction due to differences in legislation and issues of addressing these.</li> </ul> <p>Weak points</p> <ul style="list-style-type: none"> <li>• The proposal falls short on discussing related initiatives and the differences, such as the French <a href="#">Catala</a> project.</li> </ul> <p>Comments</p> <p>The panel concluded that the proposal was a good fit for CHIST-ERA.</p>	<b>4/5</b>

# Intelligent Contracts for Digital Transformation Ecosystems

<b>Recommendation</b>	
<i>Suggestions on the improvement and further elaboration of the topic</i>	
<i>How weak points of the topic can be addressed?</i>	
<p>The proposal should be further improved by adding security and formal methods, possibly also data management. It should also be more strongly connected to ongoing trends in smart contracts, as well as to blockchain and ledger technology. The role of the legislation community should be clarified (it should probably be included but not take a central role, with the focus remaining on software). Related initiatives should be contrasted with.</p>	

# Artificial Intelligence for medicine (focus on trustworthy AI and standardisation)

Scientific interest and innovation potential of topic	
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<p><b>Topic: Artificial Intelligence for medicine</b></p> <p>The proposal has high societal relevance and represents a contribution beyond the current state of the art in the use of artificial intelligence and augmented reality for less invasive surgical use. However, the topic is weakly written, it should be better described about what exactly will be targeting. From the point of view of scientific impact, it is considered that there is a very high number of publications and research work already on the subject that would limit the ambition of this proposal.</p>	<b>3/5</b>

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<p>Related to the details of the topic of this proposal, it is not centered in a high quality basic research so it is not allined enough with the mission of CHISTERA to support use-inspired basic research in ICT and other domains. It is considered that the biggest challenge of this proposal would be the transfer of existing knowledge in this area to daily medical practice. The proposal requires a redefinition providing more focus. Additionally, there are several calls in Horizon Europe related to similar topics that makes this proposal to be redundant with other calls.</p>	<b>2.5/5</b>

# Artificial Intelligence for medicine (focus on trustworthy AI and standardisation)

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<i>Suggestions on the improvement and further elaboration of the topic</i>	
<i>How weak points of the topic can be addressed?</i>	
<p>This proposal could probably be improved including more focus on the novelty of a standardization protocol that guarantees the robustness and reliability of artificial intelligence applied to medicine. Still a lot of room for new standards during the procedure to validate that the medical software including artificial intelligence is trustfully and is working in the correct way in order that results can be transformed into innovations with societal or economic impact. Then, the proposal could be rewritten in order to provide more focus on this point.</p>	