The Swedish AI Society Response to the European Commission White Paper *On Artificial Intelligence A European Approach to Excellence and Trust*

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The Swedish AI Society supports CLAIRE and appreciates that much of the white paper aligns well with the CLAIRE vision for European excellence in human-centred AI. To further improve the approach we make the following key recommendations:

1. **Provide dedicated, significant and long-term research funding for both fundamental and purpose-driven research on AI to promote AI that is trustworthy and to address relevant scientific, ethical, sociocultural and industrial challenges.** This is a necessary complement to the push for AI regulation. Europe cannot be a leader in AI regulation without being a leader in AI, and it cannot be a leader in AI applications or innovations without being a leader in foundational AI research. The funding should be independent of, and parallel to, any funding programme on ICT. Significant investment in basic funding is required to achieve adequate research independence, which is necessary for fundamental excellent research in AI. The overarching goal is to ensure world-class research that contributes to Europe's sustainability, growth and competitiveness, and inclusion, leading to individual and societal well-being. This necessitates a European research community that can unite through strong collaboration, and that can join forces with industry and society at large to build on European research strengths and enhance Europe's well-being. **To ensure that European AI systems, products and services can both comply with European norms and values and compete and take global markets, we need the capability to build them here.**

2. **Create incentives and support for interdisciplinary and multi-stakeholder research for example through large-scale challenge-driven research missions.** While striving for technological leadership, also ensure the involvement of social scientists, humanities scholars, and other interdisciplinary collaborations in European AI research projects. As AI is having a greater and greater impact on society at large, there is a corresponding increase in the need to study these impacts from humanistic and social scientific perspectives. This is also an area where Europe has a well established track record. *The WASP-HS programme (https://wasp-hs.org/) in Sweden is a good example.* Foster the involvement of civil society in AI research programme design and in projects (e.g. through citizen science) where appropriate.

3. **Simplify and streamline the structure of research funding instruments.** Reduce the overhead in efforts and time to decisions of applying for grants, for example through early reviews from abstract-sized submissions; improve the quality and consistency of

proposal reviews, and increase the predictability of funding instruments and their timing to support long-term planning. For example, since top researchers produce excellent results with high consistency, there should be a clearly defined funding scheme allocated based on track record rather than the need for extensive research proposals, including both fundamental research and bringing research towards innovation. A separate scheme should focus on identifying the most promising ideas and promoting them even if they come from less established research environments, allowing them to grow. Finally, substantial funding opportunities also need to be provided for talented junior researchers without a long-standing track record.

4. **Create the proposed lighthouse centre in a way that effectively achieves critical mass, synergy, and cohesion across the European AI ecosystem** without permanently dislocating talent from where it is needed most. Make sure this is focussed on excellence and a site selection process grounded and transparently managed on the basis of politically neutral, externally validated criteria. The lighthouse should be a symbol for European ambition and achievement in this area, a global magnet for talent, and the centrepiece of an AI ecosystem that spans all of Europe and all areas of AI. It should be "**the place to be**" when it comes to **AI research and innovation in Europe**. Somewhere people can meet for a period of time to work with other leading researchers and experts from all over the world on the most exciting and important topics, technologies and applications of AI. Through sabbatical and other temporary scientific positions, the Hub will not drain talent from labs around Europe. Rather, it will act as the **beating heart of European AI**, a **place where knowledge is mixed** by the visiting researchers **and then spread out** again to the labs in the network with the returning researcher, thereby strengthening the development of excellent AI research across all of Europe.

5. **Invest both in up-/reskilling and in basic education related to AI.** AI talents with expert knowledge are required who are capable of driving, managing and conducting AI activities in their institutions and organisations. Increased funding is not sufficient to create an excellent innovation environment. Europe also needs to attract, develop and retain a comprehensive talent pool of AI-developers, entrepreneurs and data analysts, and to create a beacon for talent. This will require dedicated efforts in establishing cross-disciplinary AI curricula in tertiary and post-graduate education which integrate ethics, humanities and technical disciplines, in mainstreaming AI-related skills in all academic disciplines and professional fields, as well as in fostering cooperation spaces between AI experts and professionals. Education is therefore fundamental. Europe already has a good educational system that can be further improved. First, there is a need to significantly increase the volume of **broad AI educational programmes with a focus on technology** (at all levels including BSc, MSc, PhD, and postdoctoral). Second, develop **specific AI educational programmes with a focus on dissemination in other sciences and society as a whole** (at all levels including BSc, MSc, PhD, and postdoctoral). Third, make sure that **primary and secondary education** provides the

necessary theoretical and practical foundations to allow everyone to become active and engaged citizens in the modern society, where AI is a natural part. **Develop and implement a European Curriculum in AI.**

6. **Adopt a definition of AI that captures what distinguishes AI approaches from other kinds of advanced computation: They exhibit key aspects of behaviour considered as intelligent in humans, and thus enable fundamentally new levels of automation and delegation.** AI is a moving target. It is a movement and aim rather than system properties. So AI is always something we work towards, rather than something that is. With a non-standard definition of AI, there is a risk that both initiatives and regulation are misaligned with what is commonly understood to constitute AI technology. While there is no universally accepted definition of what constitutes AI technology, defining AI as “a collection of technologies that combine data, algorithms and computing power” (p. 2) is problematic - especially, since it is later stated as forming the basis of any regulatory framework to be created (p. 16). While AI technologies make (to varying degrees) use of data, algorithms and computing power, so do many other types of information systems. Furthermore, while all AI systems rely on sophisticated algorithms, some require large amounts of data, others large amounts of computation, and yet others both. **AI thus encompasses algorithms and systems that can replicate, support or surpass human reasoning processes; learn, draw conclusions and make predictions based on large or small quantities of data; replicate or enhance human perception; support humans in planning, scheduling, resource allocation and decision making; and cooperate with humans and other AI systems.** The definition used in the white paper does not reflect these diverse roles and capabilities of AI systems. It also does not consider that AI systems can be dynamic, non-deterministic, autonomous, adaptive and interactive. As a result, **it is unclear what needs to be supported and regulated. While we believe it is hard to come up with a single definition that captures all the relevant aspects of AI, there is a need for serious effort in that direction, even if the final result is expected to be imperfect or contested..**

7. **Focus "AI made in Europe" on "AI for Good" and "AI for All"**. Take global leadership in supporting publically funded, large-scale AI research and innovation with a clear focus on the good of our citizens, our society and our planet. One strategy to achieve this is to promote and invest in interdisciplinary initiative, such as those mentioned in item 2 above. We should aim at creating intelligent machines that implement fundamental and shared values, respect and amplify human abilities and support the shaping of a better society. We should maximally leverage AI for achieving the UN Sustainable Development Goals - **"AI made in Europe" should be "AI for Good"**. It is also important to embrace the diversity of the different regions and cultures in Europe, making sure that the AI framework benefits all of Europe and leverages the talent and resources our diverse regions and societies have to offer. The European approach to AI should foster the accessibility of knowledge and broadly deployed technology by everyone, across different generations, with or without specialised education, by

lowering the barrier to entry for the effective, safe and beneficial use of AI - **"AI made in Europe" should be "AI for All".**

8. **Invest in promoting broader awareness of AI in society**, and specifically of how AI technologies affect society and citizens; this is critical for the responsible use of AI and forms the basis for constructive engagement based on realistic expectations and adequate perception of risks. It also strengthens the autonomy of people, in line with the first principle of the European Ethics Guidelines for Trustworthy AI, the respect for human autonomy.

9. **Establish a clear strategy for coordinating and structuring an AI-based innovation ecosystem across Europe.** Change existing policy instruments and strategies to take into account the significant role of entrepreneurs and private capital in the modern, AI-driven innovation economy. Innovation as a "value chain, starting in research and innovation" (p. 3), where the objective of policy measures is to "create the right incentives to accelerate the adoption of solutions based on AI" does not reflect the current paradigm shift in innovation, a shift that is strengthened by AI. TRL-thinking does not help. Disruptive, user- and design-driven innovation, and entrepreneurship short-circuit the ladder. Furthermore, it is not a value chain. It is a value network of actors that make things happen. In this game, Europe is not in the lead. Europe does not create new businesses destined for growth and has few innovation ecosystems of strength and coherence. Europe has many small companies and startups, but very few of these scale up, instead they have a tendency to get bought but investors from outside Europe. It is therefore important to develop policy instruments that address this. **The interaction between fundamental research and other functions in the innovation ecosystem needs to be substantially increased, and time from research to market needs to be shortened. European AI centres should be established with the mission of building and growing the European AI innovation ecosystem.**

This response was approved by the SAIS board on Friday June 12th after consultation with its members. Contact person is: Fredrik Heintz, *fredrik.heintz@liu.se*.

The Swedish Artificial Intelligence Society, SAIS, is a non-profit organization formed in 1982 to promote research and application of Artificial Intelligence. The current president is Fredrik Heintz from Linköping University. SAIS organizes an annual conference, grants a yearly Master's Thesis Award, and supports national AI activities. SAIS has for example been responsible for organizing the European Conference on AI (ECAI) in 1990, the International Joint Conference on AI (IJCAI) in 1999, and the first joint IJCAI-ECAI in 2018. SAIS has about 100 members who are researchers, professionals, students, and individuals active in, or interested in the area of Artificial Intelligence in Sweden. SAIS is part of EurAI (European Association for Artificial Intelligence) and a supporter of CLAIRE (Confederation of Laboratories for Artificial Intelligence Research in Europe).