COMPANIES INTERVIEWS: HUAWEI

Article by the Observatory of Society and AI, AI4EU
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ABOUT THE COMPANY

Huawei has developed an AI portfolio which includes products such as Ascend (chipset), Atlas (sever/module), MindSpore (developer framework), and the Application Enablement layer (e.g., CV/NLP). We are investing heavily in AI research, which focuses on developing the capabilities for more efficient, secure, and automated machine learning solutions.

Our recently announced Ascend family of AI chips will power a full range of AI scenarios for customers and partners. These chips are part of a portfolio that includes an automated development toolkit, a unified training framework, and a set of powerful application enablement tools. The goal is to give companies and developers the power, tools, and platforms they need to develop AI applications for almost any situation.

INTERVIEW

As a matter of fact, working on AI raises ethical issues. Which are the ethical challenges in your job and which effort you and your team make to avoid it?

A large number of civil society organizations, companies and academics have highlighted a range of risks AI presents, such as fairness, transparency, accountability, and bias. These are all important and as such we have invested considerable efforts in tackling them. For example:

- From a technical point of view, our MindSpore team has been developing modules that allow users to understand how certain machine learning outputs were reached, helping achieve more transparency. They are also exploring tools to interrogate algorithms and test various mathematical definitions of fairness.
- From a governance point of view, we are working with think tanks and consultants to develop frameworks to allocate responsibilities and assurances-giving mechanisms to different actors in the AI supply chain. We are also exploring ideas such as the third-party auditing of AI systems.

There is any particular example of positive impact of one of your AI products that you would like to share.

Story Sign, a free app developed with the 'European Union for the Deaf', uses AI to read selected children's books and translating them into sign language. We wanted to create an authentic reading experience and make it possible for families with deaf children to enjoy an enriched story time. Given there are approximately 32 million deaf children globally and many struggles to learn to read, often due to a lack of resources bridging sign language and reading, technology can help to open the world of books to many of them and their families.

The European Approach focuses on the importance of a human-centric approach, where the human is in control of their primacy status over the AI system. Do your values agree with the European tendency, and can you describe the most important values for your job in your experience?

Absolutely. AI should be used to augment human tasks and so by definition this requires human centricity:

not only should AI help humans achieve their aims and tasks, but it should empower them and give them control. Like many tools and technologies, AI cannot be viewed in a vacuum: it operates within existing systems, norms, and values – and so should be developed and deployed with these in mind. Human centricity is definitely one of them.

AI has demonstrated to have important social (e.g., racial bias) or environmental consequences on the environment (e.g., energy consumptions). What is your position on that and how this influences your job?

This is undoubtedly true and therefore it is the responsibility of those researching, developing and selling AI to minimise these risks as much as possible. On bias, this means ensuring that datasets are representative, that outputs are reviewed and checked for bias and harmful outcomes, and that teams developing these systems are themselves diverse. For us, there is still a long way to go and we are continuously learning. The same goes for environmental concerns: when developing algorithms, we should make sure that efficiency and accuracy are not optimized at the expense of sustainability.

In 2019, Huawei released the Thinking Ahead About AI Security and Privacy Protection white paper, setting out Huawei's viewpoint on the current security and privacy challenges surrounding AI. The paper explores key topics such as technical reliability, societal applications, and legal requirements and responsibilities. Importantly, the paper proposes a number of feasible governance models, including planning trustworthy technical solutions, and adopting a shared responsibility model for AI security and privacy. The paper calls on all stakeholders to work together towards shared goals and for the healthy development of AI into the future.

This influences my job in many ways. For example, I work closely with industry bodies, thank tanks, civil society organizations, and policymakers to ensure these considerations are adequately accounted for, whether through regulations, tools, or guidance. I also engage with academics to help our engineers develop a better understanding of risks and how to mitigate them.

What are your measures to ensure the protection of human values and the positive impact of AI?

AI has seen an incredibly fast growth recently, but a lot of uncertainties remain when such systems are deployed. We think more research and development will be key to ensure AI systems are developed and deployed safely. We recently announced that over the next 5 years, Huawei will invest 100 million euros in the AI Ecosystem Program in Europe. This investment includes significant work on regulations and standards on AI ethics and security together with academic and industry partners.

As mentioned earlier, we are also exploring options such as certification schemes and the third-party auditing of AI systems, and looking to fund academic work and studentships in both technical and non-technical fields of AI ethics and safety.

Which kind of AI system do you provide?

Our recently announced Ascend family of AI chips will power a full range of AI scenarios for customers and partners. These chips are part of a portfolio that includes an automated development toolkit, a unified training framework, and a set of powerful application enablement tools. The goal is to give companies and developers the power, tools, and platforms they need to develop AI applications for almost any situation.

If you use "black box" system, how do you ensure safety?

This really depends on the particular application and context. One way to do that is to ensure there is a human in the loop where an AI system can be considered high risk. This ensures that outputs are systematically reviewed for safety and consistency by a human. In some cases, we are also able to reverse engineer some decisions made by AI systems, through tools we have developed.

According to you, what are the most important human values to protect in the creation of an AI?

The EU's HLEG noted 7 key requirements that AI systems and we think these align quite well with how we see this space. Specifically, they are:

- Human agency and oversight
- Technical robustness and safety

- Privacy and data governance
- Transparency
- Diversity, non-discrimination and fairness
- Societal and environmental well-being
- Accountability

In your experience, what are the most critical issues to consider in working with AI?

I think AI systems can come with a number of unintended consequences, and it's important to have the right oversight and governance mechanisms to identify and remedy these quickly and avoiding broader societal harms. Fairness is an important one: and this requires engineers and data scientists to work closely with end users, experts, and ethicists to understand the 'real world' impacts their tools can have.

Do your team work on AI are balance in terms of gender and ethnicity? If so, how it influences your work environment?

Huawei recognizes that the shortage of women in STEM creates a pipeline issue as there is a smaller female talent pool from which to recruit. This issue is not unique to Huawei, but rather is a challenge facing the ICT sector as a whole, both in the UK and globally. Gender diversity is improving at Huawei UK with more women working in sales and engineering roles than ever before. However, we recognize the need to increase gender diversity within leadership and senior roles.

Since last year, our UK Graduate Programme has seen an uplift in the recruitment of female graduates, all of whom hold a STEM related degree and work in STEM related positions. Additionally, our Seeds for the Future Programme has now achieved gender parity. In previous years, the initiative has taken 50 STEM undergraduates to China on a four-week training course with the aim of encouraging a diverse range of grassroots talent to pursue STEM related careers. The recruitment process is inclusive to all and since the launch of the programme in 2011, over 230 UK undergraduates have benefited from the initiative.

ETHICS

Do keep informed with the European regulations best practice or international standard? (e.g., GDPR or Trustworthy AI)

Absolutely. We are actively engaged in the EU's efforts to promote trustworthy AI, whether through standard setting, regulations, or best practice guidance. For example, in our response to the AI white paper we focused on the need for high-risk applications to be regulated under a clear legal framework, and proposed ideas for what the definition of AI should be. In this regard, we believe the definition of AI should come down to its application, with risk assessments focusing on the intended use of the application and the type of impact resulting from the AI function. If there are detailed assessment lists and procedures in place for companies to make their own self-assessments, then this will reduce the cost of initial risk assessment – which must match sector-specific requirements.

Have you heard about the European Guidelines for Trustworthy AI? What impact do you think they may have on the AI industry?

We have and have been actively following the work of the High-Level Expert Group. I think they're a helpful starting point and can give industry an idea of what is expected in terms of ethics and trustworthiness. However, there is still a long way to go before these high-level guidelines are operationalized and translated into more practical codes, tools, and standards.

Do your company have an ethical code?

Huawei values and works hard to create a culture of integrity, and requires all employees to comply with its Business Conduct Guidelines (BCGs). Outside of the organization, we openly engage and share experiences with our business partners, giving them insights into our development of a global compliance system. Huawei has appointed a compliance officer for each of its subsidiaries worldwide and established

oversight-oriented subsidiary boards, which manage and oversee the operational compliance of these subsidiaries.

Did you see the recent AI hype? what do you think?

We do see a lot of hype with AI. Capabilities are sometimes exaggerated (like "AI will solve hunger"), and you occasionally have marketing or promotional materials that fail to adequately convey limitations. Some products also claim to be powered by AI when this is not the case, or not necessary – I've seen things like AI toothbrushes marketed! It's important people are adequately skilled and equipped to be able to cut through the hype and better understand what AI is, how it works, and what realistically can and cannot do.

As a company, do you follow ethical conferences, invite external professional to assist you, or discuss on ethical implication during internal meetings?

Yes, for example we have been attending and speaking at CogX in London this year, as well as the Politico AI Summit in Brussels. We speak with a large number of academics, consultants and experts on ethics and safety, as this is an area we are very interested in. Indeed, we think it's crucial to engage externally to have a wide array of views and outlooks represented.

SOCIETY

Does your company involve in social campaign or dissemination in the risks / opportunities of use of AI?

Huawei's vision for AI is to enhance human, societal and environmental well-being. AI will create greater value for society and boost efficiency as well as addressing social challenges such as healthcare, environment protection. In the meantime, Huawei places cyber security and privacy protection at the top of the company's agenda, we have published a white paper on AI security in 2018. And we continue to contribute to wide industry ecosystem including standard bodies, trade associations to promote the responsible use of AI.

Our experience in working with environmental protection organizations tells us that ICT and AI can help us better understand and protect nature. From forest monitoring to the protection of endangered species, Huawei is actively seeking to work with more environmental protection organizations and partners. Huawei hopes to use its ICT expertise to protect and maintain ecological balance and ensure the environment can benefit from technology

Do you reflect and/or measure on the environmental and social consequences of your work? If so, why it's important in your opinion?

We try to take into account social and environmental consequences of our work in different ways. For example we are particularly committed to developing tools, technologies and applications that help further important environmental goals.

- ▪ Case 1: Protecting biodiversity is how Huawei's AI is being used by Rainforest Connection (RFCx), an NGO that combats illegal deforestation and poaching. RFCx creates sensors from upcycled old cell phones which are placed strategically across protected areas and uses AI to analyse sounds and identify loggers and poachers. Park rangers receive real-time alerts from the sensors, helping them react more quickly and efficiently to threats – targeting their limited resources to prevent environmental harm.

- ▪ Case 2: Huawei has a free mobile app called StorySign that aims to help deaf children read by translating text from selected books into sign language with AI.
- ▪ Huawei is also committed to promoting green ICT solutions: Huawei's continued investment in R&D aims to help industries conserve energy and reduce emissions via the use of new technologies and to build an environmentally friendly low-carbon society that saves resources (i.e. PowerStar energy management technology). In the case of a wave soldering unit for example, we can contribute to consuming 25.6% less energy and can saving about 31,000 kWh of electricity each year.

- ▪ AI solutions for a greener Europe: AI can facilitate evidence-based decisions and expand capacities to understand and tackle environmental challenges. Broader use of AI could reduce worldwide

greenhouse gas (GHG) emissions by 4% in 2030, an amount equivalent to 2.4 Gt CO2e. AI capability is a crucial component of the Farm to Fork Strategy as AI brings about reduced costs for farmers, improved soil management, a reduction in the use of pesticides, fresh water, and GHG emissions.

There are also indirect ways our products help further environmental goals: achieving the European Green Deal goes hand in hand with increased digitalisation which essentially leads to greater efficiency in the application of sustainable solutions. Digital technologies contribute to the greening of the economy mainly through reducing transaction costs, increasing real-time usage of data, shedding light on interdependencies and creating efficiencies: digitalisation allows everyone to do more with less. Digital technologies have the overall potential to enable a 20% global reduction in CO2 emissions by 2030 and could prevent 10 times more CO2 emissions than they actually produce.

Do you involve users, stakeholders or clients in the design process? If so, why it's that important to you?

Yes, we tend to consult with a wide range of experts, professionals, clients and public officials to ensure our products are safe, effective and meet the highest standards of trustworthiness. We're highly supportive of public-private collaboration: achieving the aims set out in the EU's AI and Data white papers, as well as the European Green Deal, demands action from all parts of the European economy. It means working together in areas that might, in the past, have seemed impossible, such as farmers working with the ICT sector. It also means the private sector, and notably Huawei, should work with governments to equip people with the skills needed to ensure the rollout and uptake of digitalisation in sustainable ways, and the reskilling and upskilling of everyone.

Do you have any other personal reflections or experiences that you want to share with us?

I would like to emphasize something I haven't seen highlighted sufficiently, which is the importance of responsible AI across the supply chain. No initiative or industry association seems to be looking at that; and while there are many AI ethics/governance initiatives, few involve all the different actors that form part of the AI supply chain. Digital Europe has a diverse group of members, but their aims are more geared towards lobbying rather than developing trustworthy AI specifically. I think for there to be effective governance mechanisms and assurances to support trustworthy AI, you need to really look at the different companies that form part of the supply chain, and better understand their respective roles.