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Fact sheet for innovation fields

Decentralized electrification

- “Energiewende 2.0” – the ongoing transition to renewable energy – is the key word for the future of our energy systems. Here, various complementary technologies that are to reduce greenhouse gas emissions to zero in a few decades are of strategic importance for Siemens. Our focus is on optimized electricity grids that transport large amounts of energy generated from renewable sources. These grids will converge with other energy networks that provide heating/cooling, gas and mobility to form so-called multimodal systems. Small and medium-sized, decentralized power plants, smart electricity meters, advanced power electronics and chemical storage solutions will play an important role. With the aid of such grids, green electricity will be converted into valuable raw materials such as hydrogen, alcohols and hydrocarbons; even CO₂ will be exploited.

Link to the detailed fact sheet: <http://sie.ag/28UT0SG>

Artificial intelligence

- Automated decisions on the basis of artificial intelligence are made practically everywhere – no matter whether it is a matter of autonomous driving, granting loans at banks or detecting suspicious objects in the course of whole-body scans at airports. In the machine learning subdiscipline, training data forms the foundation for algorithms to learn the right outcome in line with specifications made by humans. In the face of complex problems characterized by a seemingly infinite number of possible solutions, people often intuitively choose the most practical solutions. Artificial intelligence would be raised to a new level if such techniques could be converted into algorithms, thus, opening up undreamed-of possibilities for the Digital Factory, for instance.

Link to the detailed fact sheet: <http://sie.ag/28USx2W>

Autonomous machines

- Put simply, autonomous machines are smart machines that handle demanding tasks without detailed programming and human control in an incompletely defined environment. They can coordinate their behavior between each other to jointly solve problems, and therefore play a key role in the implementation of Industrie 4.0. Whether industrial or service robots, vehicles or drones, they all have the ability to capture and process information in a changing environment. Autonomous robots will independently search for the right tool to install a part, for example. To be able to work with and alongside people, robots need well thought-out systems to make sure they detect hazardous situations and get out of the way on the production line or put themselves in a safe state.

Link to the detailed fact sheet: <http://sie.ag/28SptpZ>

Connected (e-) mobility

- Self-driving vehicles with an electric motor – what researchers are currently testing in pilot projects will soon become common practice. Many experts assume these changes will be fundamental and even disruptive. This is just one example of developments in transportation technology. Ultimately, it is all about mobility concepts for the future; that is further digitalization of mobility, cloud-based applications for all means of transport, communication between vehicles and the infrastructure as a source of data for smart traffic control, sharing models and further development of electric and autonomous driving. Solutions playing a role here include an infrastructure for charging batteries quickly and safely as well as automation and sensor systems for autonomous vehicles both on the road and on rail.

Link to the detailed fact sheet: <http://sie.ag/28RQzwd>

Blockchain applications

- Blockchain is a digital log of transactions between business partners – similar to bank statements. Each block chain consists of a series of data blocks holding one or more transactions. New blocks are generated in number-crunching processes and distributed to all participants over a network. The blocks are chained together; hence the term block chain. Every change is recorded exactly. The resulting data cannot be tampered with by third parties and is transparent for everyone involved. Block chain is a potentially disruptive technology. At present, its main focus is on financial and legal transactions. In the future, it could make many processes simpler and more secure wherever a log of data transfers is required. This is very significant for Siemens in many respects, for instance when it comes to trading electricity in complex markets or to providing digital services.

Link to the detailed fact sheet: <http://sie.ag/28USmEI>

Weiterführende Informationen

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