Robotics and the Law: A European Perspective

Autonomous Systems: Why Intelligence matters

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http://www.unipv-lawtech.eu/
Outline

A. What is changing in robotics and law
   a. From robotics to autonomous systems
   b. The increased role of Intelligence

B. EU legislation: basic features

C. The case of autonomous systems and industry: Industry 4.0.

D. Conclusive remarks
   a. European attitude toward regulations and technological innovation
   b. Autonomous Systems: Why Intelligence matters
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From robotics to autonomous systems

The term **autonomous systems** can be used broadly to encompass many kinds of

- Artificial agents
- Decision-capable agents
- Operating without the direction of a human being.

Examples:

- physical robots and drones
- purely digital software agents (**non-physical** robots).
“A system acts upon its environment to the extent it changes that environment directly. A technology does not act, and hence is not a robot, merely by providing information in an intelligible format. It must be in some way. A robot in the strongest, fullest sense of the term exists in the world as a corporeal object with the capacity to exert itself physically. But again, I am talking in terms of a continuum”.

R. Calo, Robotics and the Lessons of Cyberlaw, 2015
From robotics to autonomous systems: the case of embodiment

A. Acts vs. Information: the lesson from *speech acts theory*
   - We can do things with words
   - However *doing things with words* is **NOT** the same than doing things with physical action.
   - It rather shows **how wrong is the idea that words are, by definition, external and different in kind from actions.**

B. Effects of adopting such a broad definition
   - It has the advantage of encompassing a large spectrum of technological agents
   - However it **does not imply regulations should be the same** for all the items falling into the definition.
   - ....
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From robotics to autonomous systems

SRA Technical Glossary and SRA ELS Glossary appendixes to: The Strategic Research Agenda (SRA) for Robotics in Europe, 07/2009
Autonomy and Cognitive ability in current literature

- **Focus on the ability to accomplish a task by itself, without external directions.**
  - Capability that enables a particular action of a system to be *automatic* or, within programmed boundaries, *self-governing.* (US Military Defense Science Board, DSB 2012, Section 1.1)
  - “the capacity to operate in the real-world environment without any form of *external control*, once the machine is activated and at least in some areas of operation, for extended periods of time.” (Lin, Abney and Bakey, 1988)

- **Focus on cognitive capacity, and in particular on the capacity to obtain new knowledge, interacting with the environment.**
  - “an agent’s *capacity to learn* what it can to compensate for partial or incorrect prior knowledge.” (Russell and Norvig, 2010)

- **Focus on the internal cognitive architecture of the system:**
  - A system is autonomous to the extent it does not merely react to external stimuli, but rather *integrates such stimuli into its cognitive structures, by modifying appropriately its internal states* (Castelfranchi-Falcone, 2005)
Three dimensions of autonomy

a. Independence

b. Cognitive skills

c. Cognitive architecture
  i. teleonomy (direction to a purpose),
  ii. adaptiveness (the capacity of getting inputs from the environment and changing internal states in such a way as to better respond to challenges), and
  iii. teleology (the capacity of having representations of the environment and goals to achieve, and to identify appropriate means).

These aspects of autonomy do not necessarily coexist and converge.

(Sartor-Omicini 2015)
Effects on responsibility

• A landmine
is completely *independent* in performing the operation for which it is deployed, namely, blasting when a human or vehicle passes over it. However it possesses very limited cognitive skills.

INDEPENDENCE COGNITIVE CAPACITIES

• A targeting system
follows the target and calculates trajectories until an operator pushes the “fire” button. Such system is not independent with regard to the objective of hitting the target (it is up to the operator to push the bottom). However, *it performs highly complex discriminative functions*, distinguishing many possible input states, integrating many different features of such states to determine what circumstances most probably obtain, proposing the action that is most likely to produce the desired outcome under the given circumstances.

INDEPENDENCE COGNITIVE CAPACITIES

An autonomous system is normally just a component of a larger sociotechnical system.

Crucial point: is the human still in the loop?
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The complexity of legislation in Europe

- Transnational rules
- National legislation
- International sources
- Council of Europe (47 Countries)

EU law sources: Regulations, Directives, Recommendations
Task 3.5 Standardisation
Practically all standard development related to robots takes place in ISO TC 184/ SC 2 committee and is organized in six working groups (see figure below). Nations that are currently actively participating in developing these standards are **China, France, Germany, Italy, Japan, Korea** and **UK**.

WG3 receives additional contributions from **Canada, Sweden** and **Switzerland** and the **USA**.
A MATTER OF DEFINITION

LEGALLY SPEAKING A ROBOT CAN BE

**THING/PRODUCT**

*any tangible movable item*, with the exception of:
- goods sold by way of execution or otherwise by authority of law,
- water and gas;
- electricity.

**NON-HUMAN AGENT**

entity able to **ACT**, considering its actions in the area of legal responsibility.

- **Non-contractual liability**
- **Criminal Law**
- **E-Personhood**

**IPR** **Market** **Consumer protection**

**Security Standards** **Data protection**
ROBOTS AS PRODUCTS:
EU LAWS ON MARKET AND CONSUMER PROTECTION

- Machinery Directive 2006/42
- General product safety Directive 2001/95
- Consumer goods’ sale Directive 1999/44
THE DIRECTIVE 2006/42 ON MACHINERY

To place machinery on the market:

- **a)** relevant essential health and safety requirements
- **b)** Technical file, necessary information
- **c)** Procedures for assessing conformity
- **d)** Declaration of conformity
- **e)** Marking

The case of Intellectual Property Rights

IPR & ROBOTS

ROBOTS AS **OBJECTS**
OF IP’S PROTECTION

ROBOTS AS **SUBJECTS**
OF IP’S PROTECTION

1. Copyrights
2. Database Rights
3. Patents
4. Trademark Rights
5. Industrial Design Rights
6. Semiconductor Topography Rights
7. Trade Secrets

*Utrecht University, Center of Intellectual Property Rights (CIER):*  
*Overview of Intellectual Property Rights related to the Development of Robotics in Europe*  
M.de Cock Buning, L.Belder, R.de Bruin.

*Corinne Hueber-Saintot - CEA - DRT/VALO*  
Head of Contracts and Intellectual Property Department - Saclay Center
Copyrights

**EU Legislation:**
- Dir. 2001/29/EC on the harmonization of certain aspects of copyright and related rights in the information society (ISD);
- Dir. 2004/48/EC on the enforcement of intellectual property rights (IP-Enforcement Dir.);
- Dir. 96/9/EC on the legal protection of databases (Database dir.);
- Dir. 2011/77/EU amending Directive 2006/116/EC on the term of protection of copyright and certain related rights;
- Dir. 2006/116/EC on the term of protection of copyright and certain related rights (2006 Term Dir.)
- Dir. 2009/24/EC on the legal protection of computer programs (Software dir.)
- Dir. 93/83/EEC on the coordination of certain rules concerning copyright and rights related to copyright applicable to satellite broadcasting and cable retransmission

a) Every *literary, scientific or artistic work* is copyright protected, as long as it is *original* (not copied nor derived from other works).

b) The work must be an author’s *own intellectual creation*.

c) The copyright holder has the exclusive right to produce reproductions of the work and to communicate the work to the public (copy, translate, distribute, broadcast, rent copies, etc.).

**Robots**

Many aspects of a robotic device can be copyright protected (programming codes, preparatory works, design of a robot).

Note: development of the programming software of a robotic device, requires permission of the original programmer/right holder.
Robot generated work’s ownership

What happens when intelligent agents do not assist humans in the creation of works, but generate them autonomously? Are they capable of creativity?

The robot itself is in fact the author or the inventor: who will be entitled to the rights thereto?

1. Computer programmer?
2. User?
3. Intelligent agent itself?
4. Investor (owner or person who makes financial and logistical contributions for the development)?
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Autonomous systems and regulation issues in Europe

Research in progress

• what are the legal obstacles to put advanced robotics on the market?
• Are those obstacles due to national or European regulations?
• What specific changes are needed in regulation at national and European level?

Robots in the industry

Robots in the healthcare

Self driving cars
Robots in the healthcare

Among the legal issues:
- Who is responsible in case of wrong indications?
- Who is responsible for damages caused to the user?
Robots in the industry

• Industry 4.0:
  – Internet of things
  – Big Data
  – Cloud robotics
  – Industrial robots

Image: http://www.dialoghannover.it/portfolio/industry-4-0-ce-ancora-molto-da-fare/
Robots in the industry

Human-robot interaction

- Safety issues
- Psychological issues
- New definition of job descriptions
Innovation in the workplace

LEGAL ISSUES:

Privacy and surveillance on employees
- Recommendation CM/REC(2015)5 on the processing of personal data in the context of employment
- Italian Data Protection Authority for E-mail and Internet (2007) ["In general, the employer’s control must maintain a "human dimension", which should not be inflamed by the use of technologies that can exacerbate the employer’s supervision of employees without any confidentiality and autonomy in the management of the employment relationship"]

Data protection:

Personal data vs. medical data in the cloud
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Are you ready for tech innovation?

NOT YET!
What is wrong with this image?

Law of Tech or Tech of Law
Technology

Technology is NOT added to our social reality
And law is embedded in it already

The crucial questions today:

- WHAT has really happened till now and what is happening?
- WHERE? In which areas?
- HOW? At what speed? What facilitating and hampering factors?
And more...
Responsible research and innovation (RRI) is an approach that anticipates and assesses potential implications and societal expectations with regard to research and innovation, with the aim to foster the design of inclusive and sustainable research and innovation.

RRI implies that societal actors (researchers, citizens, policy makers, business, third sector organizations, etc.) work together during the whole research and innovation process in order to better align both the process and its outcomes with the values, needs and expectations of society.

In practice, RRI is implemented as a package that includes multi-actor and public engagement in research and innovation, enabling easier access to scientific results, the take up of gender and ethics in the research and innovation content and process, and formal and informal science education.
Operational Objectives (of the HBP)

HBP research and technology development has numerous social, ethical and philosophical implications. The project thus has an interest in recognizing concerns early and in addressing them in an open and transparent manner. In particular, early engagement can provide scientists with opportunities to gauge public reaction to their work, and to hone their research objectives and processes in the light of these reactions.

The HBP will therefore launch a major Ethics and Society Programme, with the goal of exploring the project’s social, ethical and philosophical implications, promoting engagement with decision-makers and the general public, promote responsible research and innovation by raising social and ethical awareness among project participants, and ensuring that the project is governed in a way that ensures full compliance with relevant legal and ethical norms. The programme will draw on the methods developed during empirical investigations of emerging technologies in genomics, neuroscience, synthetic biology, nanotechnology and information and communication technologies ....
“A shift is perceived to be necessary towards defining at what society wants to get out of technology as well. This necessitates an assessment of the ‘right impacts’ of science and technology activities on forehand, rather than restricting these in hindsight. The focus here is on anticipating problems, taking into account wider social, ethical issues, as a form of ‘anticipatory governance’ “.

Governance does not restrict itself to the definition and implementation of regulation in the form of negative constraints for science and technology but also of positive aims in a societal setting. ... governance of science and as an incentive for right impact-innovations.
Overview of the SATORI project
Website: http://satoriproject.eu/

SATORI is a 45-month project, comprising 17 partners from 13 countries, including an intergovernmental organisation, the aim of which is to improve respect of ethics principles and laws in research and innovation, and to make sure that they are adequately adapted to the evolution of technologies and societal concerns. The partners will develop an ethics assessment framework based on thorough analysis, commonly accepted ethical principles, participatory processes and engagement with stakeholders, including the public, in Europe and beyond. The budget is € 4.7 million, and the running time is January 2014 – September 2017.

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ORIGINAL PAPER

Anticipatory Ethics for Emerging Technologies

Philip A. E. Brey
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Some questions about the anticipatory approach beyond its *prima facie* reasonableness

- Anticipatory approach AND social development, economic growth and global interaction and competition

- Anticipatory approach, normative pressure over scientists AND freedom of scientific research?

- Anticipatory approach AND its theoretically foundation. What about the case of science and tech which take an unforeseen way?
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Adaptive
Decision-making
Learning
Cognitive
Autonomous
Tele-operated

SRA Technical Glossary and SRA ELS Glossary appendixes to:
The Strategic Research Agenda (SRA) for Robotics in Europe, 07/2009
HBP Vision

The goal of the Human Brain Project is to build a completely new information computing technology infrastructure for neuroscience and for brain-related research in medicine and computing, catalysing a global collaborative effort to understand the human brain and its diseases and ultimately to emulate its computational capabilities.

• to build a completely new information computing technology infrastructure
  • for neuroscience and for brain-related research
  • in medicine and computing

• catalysing a global collaborative effort
  • to understand the human brain and its diseases and
  • ultimately to emulate its computational capabilities.
Human Brain Project (HBP)
understanding the brain, its diseases & deriving future technologies

The Neuroscope
prof. Idan Segev, (Edmond and Lily Safra Center for Brain Science, Università ebraica di Gerusalemme, Deputy Director of the HBP)
Big data analytics
Why Intelligence matters

The umbrella concept shifts from action to information processing and analytics ability.

The ability to process information becomes the main essential point.
Thank you!

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ROBOTICS LAW AND POLICY: AN AMERICAN PERSPECTIVE

Ryan Calo
Longest-running game show.
2012 A.D.

The VCR you'll tape it on.
2012 A.D.

Samsung. The future of electronics.
The Law of Finders-Keeper

Court Grants Deep-Sea Salvors Rights to Treasure

By Ken Ringle
Washington Post Staff Writer

A federal district judge in Norfolk yesterday awarded a group of high-tech Ohio treasure hunters full title to the richest shipwreck in the nation's history, slapping down in the process a gold grab attempt by 36 insurance companies, Columbia University and the administration of New York Gov. Mario Cuomo.

In a legal opinion that charts new territory in the burgeoning field of deep-ocean exploration and recovery, Judge Richard B. Kellam said any conceivable prior claim to the more than $400 million in gold aboard the SS Central America was clearly abandoned in the 132 years since the steamer sank in a hurricane while ferrying bullion and prospectors from the California gold rush.

"We're pretty happy," said Richard Robol, attorney for the Columbus America Discovery Group, which three years ago found the long-lost ship 160 miles off the South Carolina coast and 1½ miles beneath the surface. "This means every child's dream of finding a treasure ship is not only a human dream but a legal one as well."

The Discovery group, a low-profile, high-technology effort financed primarily

See TREASURE, On Col. 1

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2016 State Unmanned Systems Legislation

Click here for more interactive graphics on this year's state legislation on unmanned systems.
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Social cognition and autonomous systems

Cade McCall, PhD
OBSERVE
PREDICT
ACT
Physiological arousal

mean cross correlation = .32***, mean peak= .43, mean peak (intense period) = .64
Social cognition

- Observe
  - Movement
- Predict
Agency
Biological motion

Grosbras et al, 2011

Niko Troja, Biomotion lab, Queens University
Biological motion

Grosbras et al, 2011

Niko Troja, Biomotion lab, Queens University
Social cognition

- Observe
  - Movement

- Predict
  - Agency
  - Actions
Social attention

e.g., Friesen & Kingstone, 1998
Perspective-taking

Apperly et al, 2010
Social cognition

- Observe
  - Movement
  - Gaze

- Predict
  - Agency
  - Actions
  - Attention
  - Awareness
Understanding other minds

Heider & Simmel, 1944
Understanding other minds

Kanske et al, 2016
Social cognition

- Observe
  - Movement
  - Gaze

- Predict
  - Agency
  - Action
  - Attention
  - Awareness
  - Intentions

- Act
  - Strategically
  - Quickly
Social cognition

- **Interact**
  - Action coordination
  - Joint attention
  - Communication
  - Reciprocity
Social cognition

- **Interact**
  - Action coordination
  - Joint attention
  - Communication
  - Reciprocity
Driving: A social interaction

- **Observe** the behaviour of others
- **Predict** their future behaviour
- **Act** in line with those predictions
- **Interact** with others
An example
- Observe
  - Vehicle movement
  - Driver movement
  - Driver gaze

- Predict
  - Agency
  - Vehicle trajectory
  - Driver awareness
  - Driver intentions

- Act
  - Strategically
  - Quickly

- Interact
  - Mutual gaze
  - Coordination
  - Aggression/concession
  - Reciprocity

Dr. Cade McCall, Psychology Department
• Observe
  • Vehicle movement
  • Driver movement
  • Driver gaze

• Predict
  • Agency
  • Vehicle trajectory
  • Driver awareness
  • Driver intentions

• Act
  • Passively
  • Quickly (the handover problem)

• Interact
  • "Deferential paralysis" (Chandra Bhat)
  • Culpability?
  • Social consequences

Dr. Cade McCall, Psychology Department
Critical questions

• Can we **design** to reduce **risk**?
To anthropomorphize?

Elicit **automatic** responses to the autonomous system.

Elicit **adaptations** to the autonomous system.
Critical questions

- Can **design** reduce **risk**?
- How will perceptions of **agency** shape expectations of **culpability**?
- Can legal structures enforce **fairness** and **reciprocity**?
Autonomous Driving and the Law

Prof. Dr. Dr. Eric Hilgendorf
University of Würzburg, Germany
Introduction

• On the way to autonomous cars: air-bags, anti-blocking systems, parking assistance
• Autonomous systems: work independently of ongoing human input
• Great social impact
• Many legal problems
Constitutional Provisions

• Constitutions normally do not deal with new technological developments
• Freedom of Research
• Protection of Property
• State has to ensure safety and efficiency of road traffic
Road Traffic Law

• Vienna Convention on Road Traffic (1968)
• Spring 2014: proposals for amendments
• National vs. international law
Civil Liability

• Tort law
• Contractual liability
• Strict liability
Criminal Liability

- Causing bodily harm by negligence
- Definition of „negligence“
- Dilemma: Relieving the driver of driving tasks vs. controlling the autonomous system
 Liability of Providers

• Cars are becoming increasingly interconnected
• Downloading of data in driving cars as a standard process
• Malware?!
• Liability of the programmer + liability of the provider
• European E-Commerce Directive provides a system of provider liability
Algorithms of Death

• Autonomous accident avoidance systems
• Problem: what is the lesser evil? And can that question be decided by cars?
• Human body vs. property
• Life vs. life
• One life vs. many lifes
Summary and Outlook

• Relevant problem areas:
  • road traffic law
  • civil liability
  • criminal liability
  • provider liability
  • data protection law

• Some problems can be solved by interpretation, some require new law

• All legal problems of automated driving can be solved
• Thank you for your attention!
Drones and the Law

Kristen Thomasen
TILT, Visiting Researcher
University of Ottawa, PhD Student
University of Windsor, Prof. Law, Robotics & Society

@KristenThomasen
Drones and other emerging technologies undermine foundational assumptions.
I. Drone laws

II. What’s so special about drones

III. Privacy assumptions

IV. The way forward
Drone laws
Establish three categories for the operation of unmanned aircraft taking into account the nature and risk of the particular activity.

— ‘Open’ category (low risk): Safety is ensured through compliance with operational limitations, mass limitations as a proxy of energy, product safety requirements and a minimum set of operational rules.

— ‘Specific’ category (medium risk): Authorisation by an NAA, possibly assisted by a QE, following a risk assessment performed by the operator. A manual of operations lists the risk mitigation measures.

— ‘Certified’ category (higher risk): Requirements comparable to those for manned aviation. Oversight by NAA (issue of licences and approval of maintenance, operations, training, ATM/ANS and aerodromes organisations) and by the Agency (design and approval of foreign organisations).
Meet Lily
Woman Faces A Year In Jail For Beating Drone Operator, Assault Caught On Video

Flying drones for hobbyist purposes is mostly legal, but not everybody seems to understand that. Some say ridiculous things like “If a drone is flying over me, I’ll shoot it down.” Others get so worked up that they take the law into their own hands.

Take for example, Andrea Mears, a 23 year old woman in Connecticut who allegedly didn’t like the fact that Austin Haughwout was flying his drone (also known as a remote controlled quadcopter) at the beach.

According to Haughwout, he went to Hammonasset State Park in Madison, Connecticut to fly his remote control quadcopter. Soon after landing on his last of four flights, an angry woman, later identified as Mears approached him. Mears was on the phone with the police, attempting to get them to respond to the flight by claiming that Haughwout was “here taking pictures at the beach with a helicopter plane.”
“...a person can have no reasonable expectation of privacy in what he or she knowingly exposes to the public...”

*R v Tessling, [2004] 3 SCR 432*
R v Patrick, [2009] 1 SCR 579
R v Stillman, [1997] 1 SCR 607
“Any member of the public could legally have been flying over Riley's property in a helicopter at the altitude of 400 feet and could have observed Riley's greenhouse.”

*Florida v Riley, 488 U.S. 445*
“people not places”

*Hunter v Southam Inc [1984] 2 SCR 145*
I. Fleeting
II. Ephemereral
III. Anonymous
IV. Control
I. Fleeting
II. Ephemeral
III. Anonymous
IV. Control
I. Fleeting
II. Ephemeral
III. Anonymous
IV. Control
I. Fleeting
II. Ephemeral
III. Anonymous
IV. Control
I. Fleeting
II. Ephemeral
III. Anonymous
IV. Control
More Robust Framework

• Beyond safety
• Self-help
• Collection
• Downstream regulation
• Remedies
• Infrastructure
• Design
Internet technology, robotics and law in China
Outline of presentation

• Introduction: technology and law
• Legal challenges in *Industrie 4.0* – developing legal solutions relevant to *Made in China 2025*?
• Internet technology and law in China
• Robotics and law in China
• Summary
“The nations of the world are caught up in a revolution, which is bringing about dramatic changes in the way we live and work – and maybe even think“.

Introduction: technology and law

- Relationship between law and technology

- Law: organizing and steering the development of technology

- Development of technology: changes required in the substantive law as well as in the procedural law
Legal Challenges in Industrie 4.0 – developing legal solutions relevant to Made in China 2025?

• Legal Challenges in *Industrie 4.0*
  – Tort liability
  – IT security, or respectively, data security
  – Data protection and privacy issues

• Developing legal solutions relevant to *Made in China 2025*?
  – Similar project to Industrie 4.0
  – Based on Internet technology such as big data and cloud computing
  – German law used as model for Chinese law with great focus on German developments
Internet Technology and Law in China

Two examples:

• criminal liability for computer hacking

• cloud computing and data protection law
The example of criminal liability for computer hacking

- Internet: one of the most important human inventions in the 20th century
  - Improving the quality of life
  - Promoting economic growth

- Internet: has opened many doors for criminals to pursue their illicit goals – such as hacking
  - Characteristics of hackers
  - Methods employed by hackers
The example of criminal liability for computer hacking

- The historical development of the criminal law against hacker crime in China
  - Criminal Law PRC (CLPRC) 1979: no provisions on hacking
  - The CLPRC 1997: § 285, § 286 and § 287
  - The 7th Amendment of CLPRC 2009: two new offences added to § 285
  - The 9th amendment of CLPRC 2015: added provisions § 286a, § 287a and § 287b and criminalized companies under § 285 and § 286
The example of criminal liability for computer hacking

• The problems in criminal law provisions against hacker crime in China
  – provisions were put into the wrong chapter
    ➢ Now in Chapter 6 “endangering the administrative order of society“
    ➢ Hacker crime – very harmful to society – endangers public security?
  – Contradicts § 285
    ➢ The scope of protection of § 285 subsection 1 includes only state affairs, defence apparatus and sophisticated science or technology
    ➢ But the scope of protection of § 285 subsection 2 does not include these three areas
The example of criminal liability for computer hacking

- Outlook for the future – a personal view
  - Technological background to Made in China 2025
    - Information society
    - “Big data“ or “data lake“
    - Data: decisively important for Chinese industry
  - Future legislation
    - Much more focus on the protection of data rather than on the protection of computer systems
    - New offenses such as “data espionage“, “interception of data“ and “modification of data“, for details see German Criminal Code (StGB)
The example of cloud computing and data protection law

• Why Cloud computing?
  – Rapid economic development – firms collect huge quantities of data
  – Question: how to manage and analyse large quantities of data?
  – traditional data collection and storage – no longer able to cope with such large scale data processing tasks
  – Revenue from cloud computing services between 2009 and 2014 (statistics from IDC):
    increased from 1.66 billion EURO to 55.46 billion EURO
  – More than 300 cloud providers in China
  ➢ Alibaba Group, Tencent, Baidu, Sina and Huawei
The example of cloud computing and data protection law

- Cloud computing and the protection of personal data in China
  - Currently very intensive discussion both at EU level and in Germany
  - But currently no full legal protection of personal data in China
  - On 23.4.2013 the first time official definition of “personal data“ was given
  - Draft “China Cybersecurity Law“ proposed on 6 July 2015
  - Articles 34 - 39 – cover the protection of personal data
The example of cloud computing and data protection law

- Key principles in the protection of personal data in draft of “China Cybersecurity Law”
  - Consent of the person whose personal data is gathered (Art. 35, subsection 1)
  - Reasons for collecting personal data (Art. 35, subsection 2)
  - Disclosure of rules for the collection of personal data (Art. 35, subsection 3)
  - Confidentiality obligations of network operators (Art. 36, subsection 1)
  - An obligation [on Internet operators] to provide notice to individuals, as well as reports to competent government departments, in cases where personal data have been leaked (Art. 36, subsection 2).
The example of cloud computing and data protection law

• Deficiencies in the draft “China Cybersecurity Law”
  – Only six articles refer to the protection of personal data
  – specifically regulates only internet providers
  – Does not contain any provisions stipulating competent independent supervisory authorities or a Data Protection commissioners

• The focus of future legislation
  – take the legislative experience of EU and Germany in the field of data protection as a model: draft an independent piece of legislation
  – establish a supervisory authority and data protection commissioners as in the EU and Germany
Robotics and Law in China

- Why Robotics?
  - Industrial robots will play an important role in Made in China 2025
  - In 2014 China became the largest consumer market of industrial robots in the world (statistic from IFR)
  - For foreign robot manufacturers in the future
    - China will be an intriguing market due to the enormous demand and government subsidies
    - face risks in the Chinese market because of the unclear and imperfect legal rules for the protection of intellectual property
    - the issue of tort liability for industrial robots has not been sufficiently clarified in current Chinese law.
Robotics and Law in China

- Solving the case of a robot killing a technician at the VW plant in Kassel using Chinese criminal code
  - § 134 CLPRC
    - If the victim was killed because the robot was incorrectly programmed by the staff responsible for that task - CLPRC § 134 subsection 1 applied
    - If company management did not give the victim sufficient training to work safely with the robot, or forced the victim to work with the robot - CLPRC § 134 subsection 2 applies
    - If the victim was killed by the robot because of human error - an accident
Summary

• The examples of hackers, cloud computing, as well as robotics in China in the context of Made in China 2025, raise a wide variety of legal issues that will intensely occupy Chinese lawyers and politicians in the coming years and decades.

• A number of specific areas of the law urgently require new legislation.

• The Chinese parliament will therefore need to integrate the changes both in technology and law. It has to adapt the law to take account of technological developments and it must ensure proper legal regulation of new technologies in order to ensure their safety and rapid introduction.
Thank you very much for your attention!