

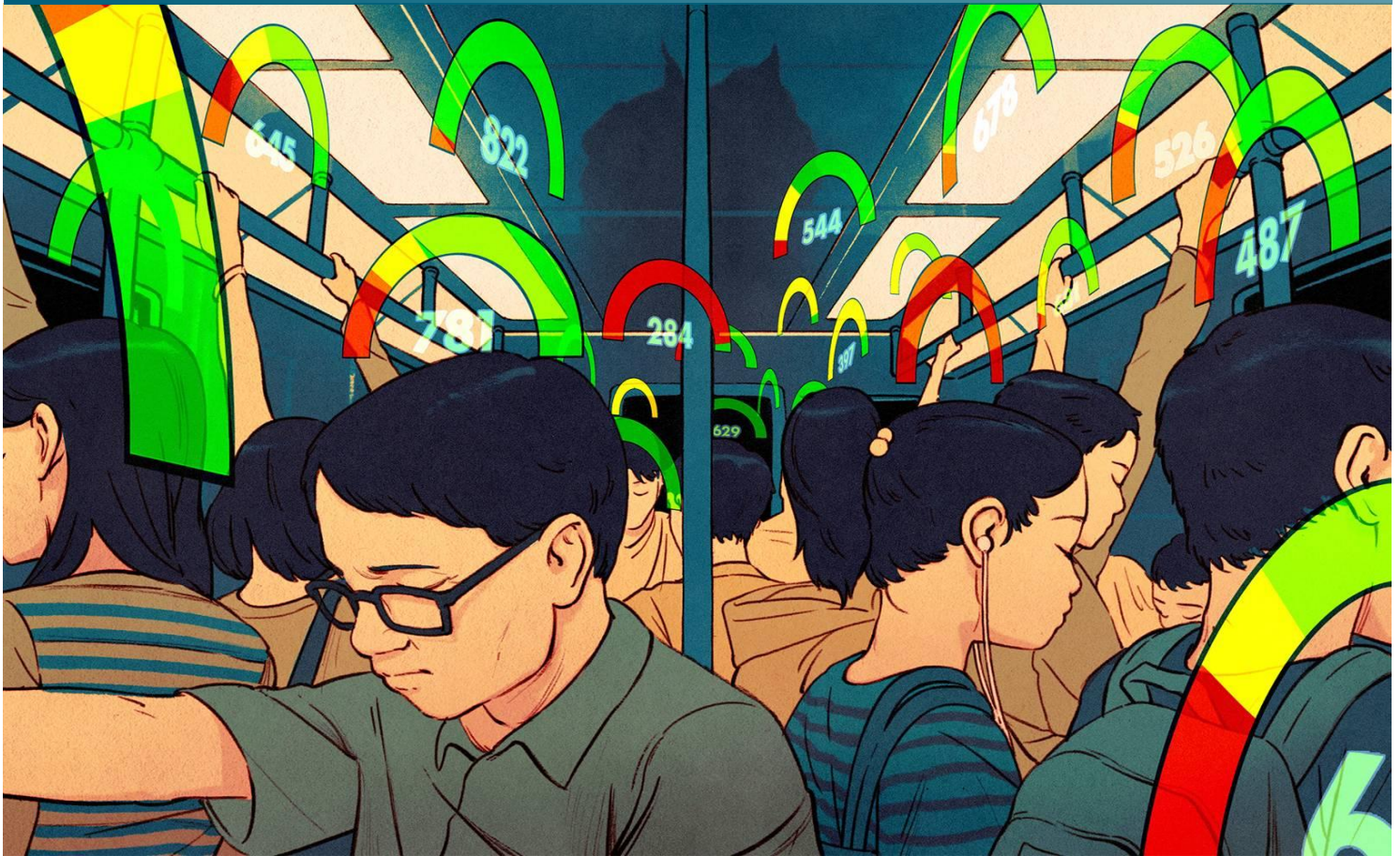


CONSULATE GENERAL
OF DENMARK
Shanghai

INNOVATION
CENTRE
DENMARK

REPORT

Social credit & big data trends *IN CHINA*



DECEMBER 2018

Table of Contents

Preface	2
1. Introduction	3
2. Creating the world’s most comprehensive system for collecting and analysing personal data	5
2.1 Standardising the ID registration of individuals and companies.....	5
2.2 Origins of the social credit system	6
2.3 The State Council’s ‘Planning Outline’	7
2.4 Decentralised policy-formulation and implementation.....	7
2.5 Pilot projects	8
3. Companies: who does what?	10
3.1 Eight companies were licensed to experiment with social credit systems	12
3.2 Sesame Credit.....	13
3.3 AI & big data applications for surveillance, security, and control	14
3.4 Face recognition technology	15
3.5 Big data management systems.....	16
3.6 Automated screening & censorship of media	16
3.7 Monitoring & surveillance through consumer products	17
3.8 Different attitudes of the big three: Tencent, Alibaba and Baidu.....	17
4. Academia: who does what?	19
4.1 Scholars have long been involved in the design of social credit	19
4.2 Notable scholars and institutions	20
4.2.1 Social Credit (general)	20
4.2.2 Company credit.....	21
4.2.3 Collection and sharing of data	23
4.2.4 AI & big data	24
5. Government: who does what?	25
5.1 Key government organisations, roles and major policy documents	25
5.2 Concretisation and implementation on a lower level.....	27
5.3 Pilot cities and provinces	29
6. Key takeaways	34

Copyright @ front page picture: Kevin Hong (permission obtained, originally used in WIRED)

Preface

For many years, Denmark has been at the international forefront in collecting public data. The Danish welfare state collects data on Danish citizens throughout their life. When relevant, universities and companies are able to access this data, which, through the Danish social security number, gives them tremendous possibilities for correlating findings with specific groups of citizens. This is particularly helpful for researchers working in life science and within healthcare. This has also attracted international research organisations to Denmark, including Chinese companies and universities, e.g. Beijing Genomic Institute.

During the recent year or two, however, China is taking data collection and data use to new levels that are unprecedented in an international context. Especially the (in)famous 'social credit'-system has featured prominently on international media platforms. But China's ambitions reach far beyond its social credit-initiatives. The Chinese government aims to ensure that China is internationally leading in Artificial Intelligence (AI) by 2030. To support this goal, China is collecting data like few other countries. Some of this data is reserved for the government use only, some data is collected and used by private companies and some data is shared between different entities as a means to improve specific elements in Chinese society, e.g. healthcare, and to help Chinese stakeholders to develop their expertise in the field.

International companies and universities can, usually through Chinese partners, access some of the data generated in China and is very interested in doing so as a means, e.g. to train algorithms. However, in Denmark there is little institutionalised knowledge about data in China, how the area is regulated and who is working with what kind of data. Against this background, this report seeks to shed light on some of the most prominent data-trends in China. The report takes the social credit system(s) as its starting point but also looks more broadly on data-collection and use in China, i.e. who are the relevant actors in government, the private sector and in research. The report also, briefly, touches upon some of the cases where data collection and use of data in China differs most significantly from practices in Europe.

Thus, the report presents an initial look into data and data practices in China, which, if current developments continue, may become increasingly important for Danish universities and companies to be familiar with.

Enjoy your reading!

MARTIN BECH, PhD

Consul for Higher Education and Science & Innovation Attaché

Mobile: (+86) 158 2106 7165

Mail: marbec@um.dk / WeChat: Bechster / Twitter: MartinBechster

1. Introduction

This study¹ looks at China's emerging social credit system including the ways in which data is collected and used in China. The area has been studied using a mixed methods approach including desk research of media coverage, social media discussion, and academic articles; data mining of two databases of academic articles and company investments; and expert interviews.

There is no clear picture of what a national social credit system will look like when fully implemented, and there are a wide range of different interpretations and competing narratives surrounding it. The word 'social' in social credit implies that it will not only build on the financial variables included in traditional credit systems, but also on individuals' and companies' behaviour in a broad sense in more areas of society. The basic goal of the social credit system is to increase the trust in society through accountability in the form of rewards and punishments: life is to be made as easy as possible for those who behave well, but troublesome for those who do not. Furthermore, behaviour in one area is to be met with consequences in other areas as well, which calls for the aforementioned connection of different data systems. As an example, individuals who fail to pay fines can be included on blacklists barring them from buying flight tickets and from other forms of 'luxury spending'. As such blacklists are published online, public shaming becomes an additional consequence of undesirable behaviour. A 2014 policy document outlining the national social credit system includes the goals of increasing trust not only in individuals and businesses, but also in the government and the legal system.

The uncertainties relate to the details of how the system will be implemented. This has two reasons:

1. The national-level policies are broad and vague, leaving a lot of room for speculation by outside observers.
2. A number of different pilot projects have been implemented at local and regional administrative levels as well as by private companies.

The fact that the pilot projects have had varying characteristics has added to the uncertainty. Citizen score systems have been constructed in local social credit programs in cities including Suining and Rongcheng, with different design and different levels of success and public acceptance. (The Suining project was cancelled following a wave of heavy criticism.) Other types of rating systems have been built by private companies, notably Alibaba's Sesame Credit, who is giving its users credit scores based on their online behaviour.

However, a national scoring system is not mentioned in the 2014 policy document that outlines the social credit system. A number of academics in China and abroad, including one Chinese scholar who was interviewed for the report, argue that there will not be any national scores for citizens at all. One European scholar who has published articles in the field argues that there

¹ The study is commissioned by ICDK Shanghai and written by Kairos Future, a consultancy based in Stockholm and Shanghai.

will not be any centralised system integrating the data for each citizen at all, and that social credit should rather be understood as 'an ecosystem of initiatives broadly sharing a similar underlying logic'². One interviewee, in particular, underlines that it has proven difficult for the government to integrate its own data with data from private companies.

The social credit system is, to a great extent, made possible by two factors: the automated analysis of large amounts of data, and the improved possibilities of connecting different data sources and following individuals as well as companies between them. The latter is largely the result of technological advances in the fields of big data management and artificial intelligence (AI), an area where a number of Chinese companies are at the forefront internationally. AI is also prioritised as an academic research field in national research strategies and plans. These include the 'Next Generation Artificial Intelligence Development Plan', issued in July 2017, through which the State Council established AI as a key research field.

² Creemers, Rogier, China's Social Credit System: An Evolving Practice of Control (May 9, 2018). Available at SSRN: <https://ssrn.com/abstract=3175792>

2. Creating the world's most comprehensive system for collecting and analysing personal data

2.1 Standardising the ID registration of individuals and companies

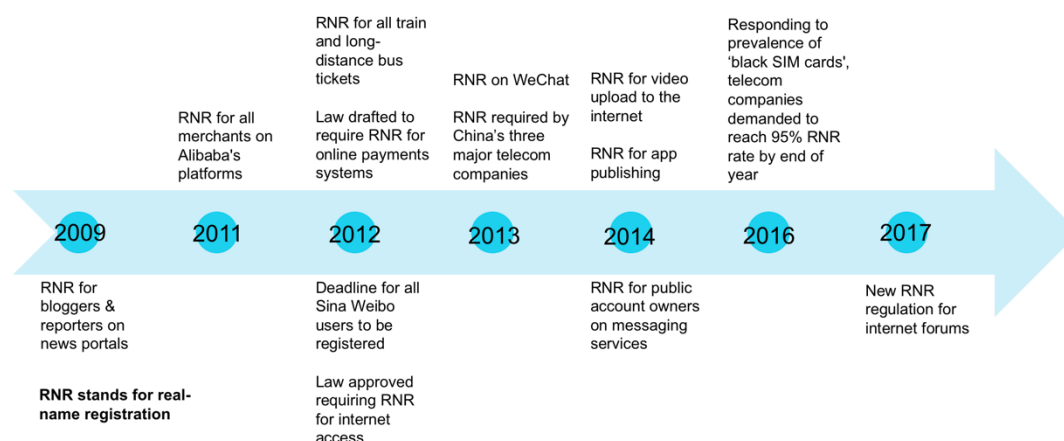


Figure 2-1: A timeline of real-name registration regulations

With the stated aims of increasing accountability of individuals and businesses and enhance the possibilities of sharing and integrating data from different platforms, the government has taken measures to facilitate identification of individuals and businesses. For individuals, this has meant that they have gradually been required to utilise their real names for online activities, including social media and e-commerce. The requirement has been extended to offline activities as well; since January 2012, personal identification has notably been required to purchase train and long-distance bus tickets.

Legal requirements for real-name registrations have been incrementally introduced across platforms over the last decade³. Starting in 2009, various blogging and e-commerce platforms, including Netease, Sina Weibo, Alibaba and WeChat, have been introducing real-name registration requirements; real-name registration is also required to upload videos on video hosting websites. In 2017, real-name regulations were introduced for all internet forums and communities⁴.

In 2012, the National People's Congress approved legislation requiring real-name registration for setting up internet access. Registering with personal ID has been a requirement for getting a mobile SIM card since 2013, and identity verification via mobile phone number is increasingly

³ A brief history of China's campaign to enforce real-name registration online [Internet] Tech in Asia (2015, February 5) Available: <https://www.techinasia.com/history-chinas-campaign-enforce-realname-registration-online>

⁴ 互联网论坛社区服务管理规定 [Internet] Cyberspace Administration of China (2017, August 25) Available: http://www.cac.gov.cn/2017-08/25/c_1121541921.htm

电信实名制实施六年无感 迎史上最严政策 [Internet] Sina Tech (2016, May 25) Available: <http://tech.sina.com.cn/t/2016-05-25/doc-ifxsktkr6036264.shtml>

required to access services such as connecting to public WiFi networks. In the years following the implementation of the real-name registration system for mobile phone users, the phenomenon of 'black cards' (SIM cards not tied to any individual) on the market remained persistent. Consequently, the Ministry of Industry and Information Technology in 2016 issued a notice requiring telecommunications companies to have a 95% real-name rate for telephone users by the end of that year⁵.

On the corporate side of things, the so-called 'All-in-One License' registration reform has been accelerated. Previously, the identification codes for organisations were comprised of various items such as one commercial registration number and one taxpayer identification number, making it difficult to effectively cross-check data from different institutions. To improve the management and sharing of information, newly established companies and other organisations are now allocated a standardised 18-digit code. The code, composed of numerals and letters from the English alphabet, identifies registration department, type of organisation, the administrative district of the registration authorities, as well as the organisation and checking code.

2.2 Origins of the social credit system

In 2007, the State Council established the Interministerial Conference on Social Credit System Construction for the purpose of constructing and coordinating the implementation of a social credit system⁶. Between 2007 and 2017, the number of institutional members in the Conference increased from 15 to 47, reflecting the many touchpoints with other government activities⁷. Amongst the institutional members, there are many high-profile actors such as the Ministry of Public Security and the Central Propaganda Department as well as the Ministry of Finance and the State Administration for Industry and Commerce⁸.

Before the State Council's decision to establish a coordinating body for the social credit system, municipal governments had already experimented with similar programs. Shanghai launched a personal credit investigation system in July 2000; by the end of 2001, the system covered nearly half of the Shanghai urban area. The system was used to place residents who would repeatedly fail to pay their gas bills on a personal credit 'blacklist', making it difficult to apply for loans. Although it was considered effective for its intended purpose, the system remained highly localised, as the data was not shared between different institutions and platforms⁹.

⁵ 电信实名制实施六年无感 迎史上最严政策 [Internet] Sina Tech (2016, May 25) Available: <http://tech.sina.com.cn/t/2016-05-25/doc-ifxsktkr6036264.shtml>

⁶ Central Planning, Local Experiments. The complex implementation of China's social credit system [Internet] Mercator Institute for China Studies (2017, December 12) Available: <https://www.merics.org/en/china-monitor/content/5071>

⁷ China's Social Credit System: An Evolving Practice of Control, Rogier Creemers, University of Leiden. Available: http://www.iberchina.org/files/2018/social_credit_china.pdf

⁸ 国务院社会信用体系建设部际联席会议简介 [Internet] Xinhua (2017, December 8) Available: <http://credit.xinhua08.com/a/20171208/1739791.shtml>

⁹ 信用制度建设 [Internet] People.cn (2002, January 7) Available: <http://www.people.com.cn/GB/quandian/28/20020107/642644.html>

2.3 The State Council's 'Planning Outline'

In 2014, the State Council published a policy document outlining a social credit system to be implemented by 2020 (called the Planning Outline for the Construction of a Social Credit System (2014-2020)¹⁰. This document is often referred to as the foundation of the ongoing efforts of creating a social credit system. However, it is seldom referenced to as a source of information when observers discuss what the social credit system will look like; a likely reason is that the document is very vague on the practical details.

The policy document outlines five main objectives:

1. The establishment of the fundamental laws, regulations and standard systems necessary for social credit by 2020.
2. The completion of a credit investigation system covering the entire society, with credit information and resource sharing as its basis.
3. The completion of credit supervision and management systems.
4. Achieving a relatively perfect credit service market system.
5. Giving complete rein to mechanisms which encourage keeping trust and punish breaking trust.

The policy document envisions that all of the persons and entities listed below will be monitored:

- *Government officials* will be monitored through projects such as e-government schemes
- *Companies*; e-commerce companies need to monitor the brands and merchants that operate on their platforms.
- *Public institutions*, such as hospitals and schools.
- *Individuals*; the credit records of citizens in both economic and social activities will be established and improved.
- *The law enforcement system*; its integrity is to be monitored to increase the trust of the public.

2.4 Decentralised policy-formulation and implementation

Apart from the basic 2014 policy outlined above, other policies have also been issued, including the Guiding Opinions on Strengthening the Building of the Personal Honesty System, published in 2016 by State Council to clarify requirements and goals about personal integrity. For other important policies, see Chapter 7.1.

Many of the more detailed policies for the social credit system can be found not in policy documents dedicated to social credit but rather within policy documents in different industry-specific areas such as tourism, transportation (especially taxi) and postal services. While these are not explicitly focused on the social credit system, they are also contributing to its

¹⁰国务院关于印发社会信用体系建设规划纲要（2014—2020年）的通知 [Internet] State Council of China (2014, June 14) Available: http://www.gov.cn/zhengce/content/2014-06/27/content_8913.htm

construction.

For example, the Ministry of Transport has formulated a policy aiming to evaluate the credit of car rental companies and taxi drivers – possibly as a response to recent high-profile accidents. They will be classified into different letter grades such as AAA or B. The car-hailing service company Didi has also created an in-app system where customers can assign grades on their driver after using the service. Similarly, the State Post Bureau of China has been tasked with constructing a credit system in the express delivery industry. This entails collecting information on the quality of courier services via various methods, including surveys, complaints, and public opinion monitoring. Companies that receive a low trustworthiness rating will be displayed on a public list distributed on websites and other media.

At this stage, the implementation of the social credit system is also decentralised and scattered over different pilot projects. This has been described as a 'web made of various schemes'¹¹. According to Rogier Creemers at Leiden University, the social credit system should be understood as an 'ecosystem of initiatives broadly sharing a similar underlying logic', rather than being 'fully unified and integrated'. Creemers notes that a potential problem with this way of implementing a social credit system is that the criteria for calculating credit, as well as the system of rewards and punishments, varies by each regional government, administrative body, and business participating in the pilot programs – meaning that citizens will be in unequal positions based on their place of residence and the platforms they use for their daily activities¹².

2.5 Pilot projects

Among the measures taken in implementation, categories that are often described as pilot projects for the national social credit system include pilot cities building social credit systems at the local level, pilot companies developing social credit score systems, and blacklists issued by official institutions banning certain individuals from activities such as buying flight tickets.

2.5.1 Pilot cities

In January 2018, the China National Development and Reform Commission published an official list of the first 12 pilot cities of the national social credit system¹³. According to the government, these pilot cities have been entrusted to undertake key tasks for establishing city-wide social credit systems as well to accumulate experiences that could eventually be replicated in all cities across the country. The pilot city schemes are described in more detail in Chapter 7.2.

2.5.2 Pilot social credit platforms

¹¹ Life Inside China's Social Credit Laboratory [Internet] Foreign Policy (2018, April 3) Available: <http://foreignpolicy.com/2018/04/03/life-inside-chinas-social-credit-laboratory/>

¹² Trust in Ratings: China's Social Credit System [Internet] Asia Global Online (2018, May 17) Available: <http://www.asiaglobalonline.hku.hk/china-social-credit-system/>

¹³ 首批社会信用体系建设示范城市公布 南京厦门等入选 [Internet] China News (2018, January 9) Available: <http://www.chinanews.com/gn/2018/01-09/8420096.shtml>

In 2015, the Chinese government permitted 8 companies to establish their own experimental social credit platforms; in 2018, an individual credit license was granted to a company which was co-established by these 8 companies together with the China Internet Finance Association. The government has also signed information-sharing contracts with 65 Chinese companies since 2016¹⁴.

2.5.3 Blacklists

In the framework of the social credit system, different blacklists are to be used as a form of punishment for specific misdeeds. For example, the supreme court has established a blacklist of individuals who have not followed court orders, e.g. by failing to pay their fines. Those included on the blacklist are barred from a number of specific forms of 'luxury spending' including booking flights or G-class high-speed train tickets. Transport companies are expected to cooperate with the public authorities to ensure this punishment is administered. In some cases, restrictions may also be imposed on the relatives of blacklisted people (including being barred from applying to some schools¹⁵).

When blacklists are displayed on websites and other media, they are effectively used as a form of public shaming. An example of this is a list of 169 of traffic offenders published in June 2018¹⁶. Ningbo City has also recently introduced a system where individuals convicted of a breach of trust will have their credit information shared on a public platform¹⁷. The public shaming comes in addition to other punishments, such as being barred from access to loans, subsidies and employment as civil servants.

In international media, the blacklists and the private credit scoring systems are frequently mixed up; the blacklists used today are however only targeting people who have been convicted for breaking the law in the traditional sense.

¹⁴ ¹⁴ 国家公共信用信息中心与品尚电商签署信用信息共享协议 [Internet] Credit of China (2018, May 31) Available: http://www.creditchina.gov.cn/xinyongdongtai/xinyongdongtaijiaodianwenzhang/201806/t20180605_117279.html

¹⁵ 黄冈一“老赖”子女考飞受限 主动履行还款义务 [Internet] Credit of China (2018, June 11) Available: http://www.creditchina.gov.cn/home/dianxinganli1/201806/t20180608_117694.html

¹⁶ China names 169 people banned from taking flights or trains under social credit system [Internet] South China Morning Post (2018, June 2) Available: <http://www.scmp.com/news/china/policies-politics/article/2148980/china-names-169-people-banned-taking-flights-or-trains>

¹⁷ 浙江宁波：全国失信被执行人将面临联合信用惩戒 [Internet] Xinhua (2018, June 13) Available: http://www.xinhuanet.com/2018-06/13/c_1122979113.htm

3. Companies: who does what?

In 2015, eight companies were allowed to build experimental platforms for calculating social credit. As their basis, the companies used financial history data supplied by other institutions, which is what credit systems normally rely on. At least some of the platforms, including Sesame Credit, are reported to also have taken into account non-traditional factors, such as what friends an individual has, when calculating social credit scores. However, none of the systems built by these companies have yet been allowed to become part of the national social credit system.

In addition to the social credit systems themselves, there is a lot of activity in industries developing technologies, which can be used for control and surveillance. Artificial intelligence (AI) and big data are two important fields here that have attracted large venture capital investments, demonstrated strong growth, and produced several unicorn startups. Table 5.1 below shows a selection of notable startups in the fields of AI and big data.

Startup	Location	Description	Funding (USD mn)	Backers
SenseTime	Beijing	Leading AI startup which focuses on computer vision and deep learning	2,232.8	IDG Capital, Wanda Group, Alibaba, CDH Investment, Morningside Venture Capital
Cambricon	Beijing	Maker of AI chips	1,338.8	Oriza Holdings, Lenovo, Alibaba, Ifytek
Face++	Beijing	Operates a face recognition cloud services platform	514.0	Foxconn, China Reform Holdings Corporation, Ant Financial, China Investment Corporation
YITU Technology	Shanghai	Engaged in fundamental research of AI, aiming to find solutions for machine vision, listening and understanding	221.8	Yunfeng Capital, SEQUOIA Capital, Gaorong Capital, Hillhouse Capital Group
Mobvoi	Shanghai	Developing Chinese voice recognition, natural language processing, and vertical mobile search	205.7	SEQUOIA Capital, SIG Asia Investment, Zhen Fund
Unisound	Beijing	Intelligent voice recognition and speech processing developer	196.8	Qiming Venture, Qualcomm Ventures, Qihoo 360
Cloud Walk	Chongqing	Face recognition surveillance system developer	164.1	Shenzhen Qianhai Xingwang Investment, Oriza Holdings, Shunwei Capital
iCarbonX	Shenzhen	Aiming to build an ecosystem of digital life based by applying artificial intelligence on consumers' 'life data'	164.0	Tencent, Share Capital, DT capital
DataVisor	Beijing	Leading fraud and financial crime detection service provider	94.5	SEQUOIA Capital, NEA, GSR Ventures
Black Sesame Technology	Shanghai	An AI digital imaging technology firm	80.0	Northern Light Venture Capital, NIO Capital,

Table 3-1: Selection of notable startups in the fields of AI and big data ranked by amount of funding

3.1 Eight companies were licensed to experiment with social credit systems

The eight above-mentioned companies that were permitted to start building their own social credit systems in 2015 were: Pengyuan Credit Service (Tianxia Credit), Ant Financial (Sesame/Zhima Credit), Tencent (Tencent Credit), Qianhai Credit, China Chengxin Credit (Wanxiang Credit), Kaola Credit, Sinoway Credit, and Intellicredit. These social credit systems were intended to evaluate people's liability in relation to bank credits and for other commercial purposes, based on financial history – but also, at least in some of the cases, on less traditional factors such as consumption patterns and which friends an individual has. However, the Credit Reference Center of the People's Bank of China has stated that none of these companies have succeeded at fulfilling its requirements, and therefore, they will not be granted the license of individual credit. Consequently, the credit scores from these companies cannot be used as a proof of credit, and it is illegal for the companies to issue any individual credit report¹⁸.

While licenses have not been granted to any of the eight above-mentioned companies individually, the Credit Reference Center did in February 2018 grant an individual credit license to Baihang Credit – a company collectively owned by the eight companies along with China Internet Finance Association. The credit reports of Baihang Credit will be used as formal reports for online lending activities¹⁹. The granting of a credit license to a company owned jointly by the eight companies can be described as a means of forcing these into collaboration. According to one of the Chinese researchers studying social credit who have been interviewed for this report, the companies have for commercial reasons been very reluctant to share the data from their respective systems with each other or with the government.

The China National Public Credit Information Center has also established its own national credit platform called 'Credit China'. Each organisation, company and individual will be allocated an unique social credit code for the purpose of facilitating tracking between different data systems. The Credit China platform will enable citizens to check their credit information by using this code. So far, the Center has gathered over 16.7 billion data units on credit information nationwide. It has signed an information-sharing contract with 65 Chinese companies, including financial institutions such as the Bank of Suzhou, technology companies such as Alibaba, Tencent and Baidu (the 'big three'), and 'sharing economy' platforms such as Ofo and Mobike²⁰.

¹⁸ 8家征信试点机构无一达标，央行释疑：几个没想到 [Internet] caijing.com.cn (2017, April 22) Available: <http://yuanchuang.caijing.com.cn/2017/0422/4263269.shtml>

¹⁹ 央行颁发中国首家个人征信牌照，3年有效期！ [Internet] Sohu News (2018, February 22) Available: http://www.sohu.com/a/223532531_313745

²⁰ 国家公共信用信息中心与品尚电商签署信用信息共享协议 [Internet] Credit of China (2018, May 31) Available: http://www.creditchina.gov.cn/xinyongdongtai/xinyongdongtaijiaodianwenzhang/201806/t20180605_117279.html

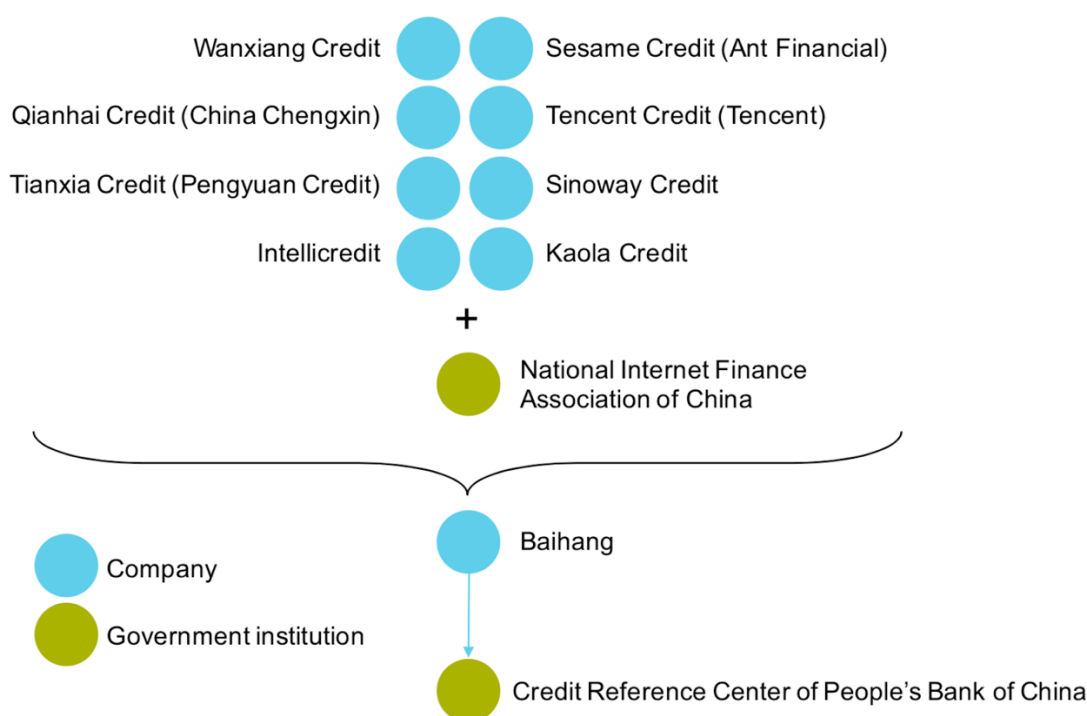


Figure 3-1: An overview of actors licensed to implement social credit systems.

3.2 Sesame Credit

Ant Financial, running Sesame Credit (also known as Zhima Credit), is one of the 8 companies that were allowed to build their own social credit systems in 2015. It provides an interesting case study for two reasons. First, because it was a pilot test for using data other than financial history to build a credit score system. Second, because of the considerable attention it has gained from foreign observers. Sesame Credit is often used in foreign news media as an example of what a unified national social credit system could look like, something which critics describe as a grave misunderstanding.

Sesame Credit is a credit rating function integrated in Alipay. It was developed by Ant Financial, Alibaba's finance affiliate, and leverages historical data generated from Alibaba's online retail platforms and Alipay, which is used both for online and offline purchases. Sesame Credit is voluntary to use, although some users report not having activated it consciously. The system calculates a 3-digit score based on a range of Alipay activities including credit history, fulfilment capacity, behaviour and preferences (such as shopping habits), and social media interactions (the behaviour and scores of users' friends can indirectly affect their own score)²¹. High credit scores can be converted into real-life benefits; for example, users with a score over 600 are allowed to use the Ofo shared bicycles and checking into hotels through Fliggy without paying a deposit.

When evaluating Sesame Credit, the People's Bank of China has found it unsuitable as a general credit rating system since it favours people who engage in financial activity on the

²¹ Sesame Credit [Internet] Available: <http://www.xin.xin/#/detail/1-2-0>

platforms provided by Alibaba and its partners²².

3.3 AI & big data applications for surveillance, security, and control

Dubbed the 'Skynet', China's video surveillance network is one of the largest in the world, with over 20 million CCTV cameras in operation in 2017²³. (Some observers suggest even higher figures; according to a report from IHS Markit, there are 176 million CCTV cameras installed in the country²⁴.) Meanwhile, China is also the world's largest surveillance equipment maker. The development of big data and AI technologies is fueling strong growth in the sector, as CCTV cameras and other surveillance equipment is being enhanced with these technologies.

Several unicorn startups have emerged from related sectors, while some conventional companies have also moved to become big players in AI. For example, Hikvision²⁵ and Dahua Technology²⁶, both of which started as conventional video surveillance providers in 2001, have made significant investments in AI research and development in recent years.

The AI startups with the highest valuation are now found in the field of computer vision. Earlier this year, SenseTime became the world's most valued AI company, valued at US\$3 billion in a recent venture round²⁷. Other major AI startups in the sector include YITU²⁹, Megvii³⁰ (developer of the Face++ system) and Cloud Walk³¹. All of these startups have received investments from Alibaba.

Another relevant sector is the voice/speech recognition and natural language processing field, where iFlytek, founded in 1999, is considered the leader. Promising startups in this sector include Chumenwenwen³² (Mobvoi), Unisound³³ and AISPEECH³⁴.

While some of these companies are explicitly developing surveillance systems (such as

²² 家征信试点机构无一达标, 央行释疑: 几个没想到 [Internet] caijing.com.cn (2017, April 22) Available: <http://yuanchuang.caijing.com.cn/2017/0422/4263269.shtml>

²³ 全国监控摄像头数量统计 [Internet] chinabgao.com (2017, October 17) Available: <http://www.chinabgao.com/k/jksxtxy/29691.html>

²⁴ 中国安装了 1.76 亿个监控摄像头, 这市场还在增长 [Internet] Qdaily (2017, November 21) Available: <https://www.qdaily.com/articles/47431.html>

²⁵ Hikvision AI vision takes shape [Internet] ITP.net (2018, January 25) Available: <http://www.itp.net/616379-hikvision-ai-vision-takes-shape>

²⁶ Dahua Technology Presents "AI Creates Value" at ISC West [Internet] Dahua Technology (2018, April 12) Available: <https://us.dahuasecurity.com/2018/04/12/dahua-technology-presents-ai-creates-value-at-isc-west/>

²⁷ China Now Has the Most Valuable AI Startup in the World [Internet] Bloomberg (2018, April 9) Available: <https://www.bloomberg.com/news/articles/2018-04-09/sensetime-snags-alibaba-funding-at-a-record-3-billion-valuation>

²⁸ SenseTime Raises US\$600 Million in Series C Funding [Internet] SenseTime (2018, April 9) Available: <https://www.sensetime.com/news/669.html>

²⁹ YITU Technology: <http://www.yitutech.com>

³⁰ Megvii: <https://www.megvii.com>

³¹ Cloud Walk: <http://www.cloudwalk.cn/caseList.aspx?id=78&page=1>

³² Mobvoi: <https://www.chumenwenwen.com/>

³³ Unisound: <https://www.unisound.com/>

³⁴ AISPEECH: <http://www.aispeech.com/>

SenseTime and Megvii with its Face++ system), others are focused on technologies that have indirect applications for surveillance and control. For instance, AI chip makers are inadvertently contributing to the surveillance sector. The biotechnology AI startup iCarbonX, which reached unicorn status in 2016, provides another example of possible indirect surveillance applications³⁵. The company collects users' biomedical and behavioural data to offer them personalized advice.

3.4 Face recognition technology

Across China, the Government is leveraging sophisticated facial recognition technologies to monitor citizens behaviour. Facial recognition and AI technology is also slowly being applied in relation to the social credit system(s). For example, in the city of Shenzhen to punish jaywalkers³⁶. However, the main applications of face recognition technology are security and law-enforcement. The Skynet surveillance system used by China's authorities has already integrated advanced face recognition technology. The technology is very fast, reportedly enabling the authorities to 'scan the Chinese population in just one second'³⁷. It is also claimed to have a higher accuracy rate in recognising faces than the human eye (99.8% versus 97.52%³⁸).

In practice, the Skynet system has proved to be high-performing, enabling the police to detect and arrest over 2000 fugitives nationwide over the past two years. As an individual case example, the police in Jinhua, Zhejiang province, recently succeeded in arresting two fugitives in a concert with the help of a facial recognition system at the entrance. The system was developed by YITU Technology, a Shanghai-based AI unicorn, whose main focus is on intelligent safeguard systems and smart healthcare³⁹.

Many other companies are also developing face recognition applications – Alibaba, Baidu, Cloud Walk, Didi, Huawei, iFlytek, JD, Megvii, Ping An, SenseTime, Sensing Tech, Sogou and Tencent, to name a few of the most significant.

In addition to YITU, two of the currently most influential companies in this sector are Cloud Walk and SenseTime. The facial recognition surveillance system developed by Cloud Walk has been widely adopted by local public security agencies and installed in public places, such as train stations and gas stations⁴⁰. Meanwhile, the vision-based solutions developed by

³⁵ 成立 9 个月的独角兽，碳云智能要造一个现实版“大白” [Internet] Leiphone.com (2016, July 7) Available: <https://www.leiphone.com/news/201607/yjgKePniZddo6BG4.html>

³⁶ Jaywalkers under surveillance in Shenzhen soon to be punished via text messages [Internet] South China Morning Post (2018, March 27) Available: <https://www.scmp.com/tech/china-tech/article/2138960/jaywalkers-under-surveillance-shenzhen-soon-be-punished-text>

³⁷ 'Sky Net' tech fast enough to scan Chinese population in one second [Internet] Global Times (2018, March 25) Available: <http://www.globaltimes.cn/content/1095176.shtml>

³⁸ “天网”已应用全国 16 省市 人脸识别技术助力安防 [Internet] China News (2018, March 23) Available: <http://www.chinanews.com/gn/2018/03-23/8474149.shtml>

³⁹ 张学友背后有高人，“逃犯克星”神助攻来自上海“独角兽” [Internet] Shanghai Observer (2018, June 13) Available: <https://www.jfdaily.com/news/detail?id=92858>

⁴⁰ Cloud Walk: <http://www.cloudwalk.cn/caseList.aspx?id=78&page=1>

SenseTime have also been widely applied in the public sector. These solutions include SenseFace, a facial recognition surveillance system, and SenseFoundry, an open platform for visual data of cities. In Yunnan province, SenseTime has collaborated with the provincial public security department to build a province-wide facial recognition platform designed for preventing and solving crimes⁴¹.

Some companies which started as conventional video surveillance providers have now branched out to AI technologies. Two of the leading examples are HikVision and Dahua Technology, both of which have established in-house teams to update their software and hardware products as well as joint ventures with emerging AI startups⁴². HikVision has succeeded at deploying its technology outside China as well. The company claims that its face recognition-enhanced camera systems enabled the Cape Town suburb of Sea Point in South Africa to achieve a 65% reduction in crime⁴³.

3.5 Big data management systems

As the number of surveillance cameras increases, and visual data analysis systems become increasingly sophisticated, the need for big data management systems also becomes more urgent. Several companies are now developing technologies to organise and manage the vast amounts of data collected by the Skynet. For example, Huawei has developed a 'Safe City' system for organising and storing CCTV videos and other surveillance data⁴⁴. Meanwhile, Megvii (known for its Face++ system) has helped the Ministry of Public Security to build a national digital ID database for comparing and searching faces.

3.6 Automated screening & censorship of media

AI technologies can also be harnessed for the purposes of screening and censoring media and online content. AI-assisted content screening systems can increase the accuracy of detecting pornographic, violent and other unlawful content, therefore reducing costs and employment. An example of such a service is SenseMedia, launched by SenseTime in April 2018. The service claims an accuracy rate of over 99.5% and costs as little as 3,000 yuan per day. According to SenseMedia, its service can replace a screening team of 2,000 people for a video streaming service or 200 people for an online image service⁴⁵.

A different approach is taken by news platform Toutiao, which has launched an experimental censoring system in the form of a WeChat app allowing users to themselves monitor content. In the app, articles are scored depending on how likely they are to contain offending content,

⁴¹ SenseTime: <https://www.sensetime.com/cases?lang=zh-cn>

⁴² 胡扬忠：海康威视 AI 平台将正式对外开放 [Internet] Leiphone.com (2018, March 30) Available: <https://www.leiphone.com/news/201803/8Ew5eeByRfiYNwvP.html>

⁴³ Sea Point sees two-thirds Crime Drop after Hikvision Cameras Deployed [Internet] Hikvision (2015, May 8) Available: <http://www.hikvision.com/europe/Press/Success-Stories/Transportation/305529081636891>

⁴⁴ 平安城市解决方案 [Internet] Huawei, Available: <http://e.huawei.com/cn/solutions/industries/public-safety/safe-city/safe-city>

⁴⁵ 商汤一口气发布五大 AI 新品 [Internet] Sina News (2018, April 25) Available: <http://t.cj.sina.com.cn/articles/view/1826017320/6cd6d028020006mqj?display=0&retcode=0>

and manual review is prompted in suspect cases⁴⁶. Toutiao has previously created highly innovative systems for AI curation and crowdsourcing of journalism; it is now applying similar technology for developing media censorship applications, albeit currently at an experimental stage as far as the WeChat monitoring app goes. Toutiao might however be expected to introduce increased self-censorship following criticism from the Chinese government over 'vulgar content' featured on the platform. Chief executive Zhang Yiming in April 2018 published a public apology in which he promised to modify the platform's aggregation algorithms to 'correct the flaws'. South China Morning Post drew parallels between the apology and 'the "self criticism" of "wrongdoers" during the era of Chinese leader Mao Zedong'.⁴⁷

3.7 Monitoring & surveillance through consumer products

As companies are increasingly collecting user data via consumer products, questions have been raised about the applications of this data. For example, Huawei has been accused of unethical use of phone users' data. Another example is provided by the IT security company Qihoo 360 with its live streaming platform Shuidi, which was used to display footage from Wi-Fi-enabled CCTV cameras in real time. Many of the streams were public, meaning that users could watch and comment on livestreamed CCTV footage from various public places. This eventually provoked a backlash, as citizens felt the public livestreaming of security footage without permission was a violation of their privacy. After a period of 'reflection', Qihoo 360 decided to shut down the Shuidi platform⁴⁸. However, the company will continue to issue its WiFi-integrated cameras to kindergartens for free, enabling parents to monitor their children; something many parents are keen to do, following reports of gross misconduct committed by staff members at some kindergartens.⁴⁹

Other ways in which consumers can be monitored include image analysis systems for cars developed by SenseTime and Megvii to monitor drivers. These systems can for example detect when a driver is too tired^{50,51}.

3.8 Different attitudes of the big three: Tencent, Alibaba and Baidu

Among the 'big three' (Tencent, Alibaba and Baidu), views on collecting user data vary. While Tencent and Alibaba state they only monitor and share user data when it is required by the law, statements by Baidu representatives indicate that the company is less opposed to the idea of sharing of user data with third parties.

The Alibaba-affiliated Sesame Credit claims it does not share either user data or users' credit

⁴⁶ 今日头条灵犬系统简介 [Internet] Zhihu (2018, April 3) Available: <https://zhuanlan.zhihu.com/p/35265738>

⁴⁷ China's king of titillating content Jinri Toutiao issues apology for providing what the people want [Internet] South China Morning Post (2018, April 12)

Available: <https://www.scmp.com/tech/china-tech/article/2141312/chinas-king-titillating-content-issues-apology-providing-what-people>

⁴⁸ Qihoo 360 shuts down surveillance camera live streaming platform [Internet] Technode (2017, December 20) Available: <https://technode.com/2017/12/20/shuidi-shutdown-qihoo-360/>

⁴⁹ Three Things to Know About China's Kindergarten Abuse Scandal [Internet] Time (2017, November 27) Available: <http://time.com/5037556/china-beijing-kindergarten-abuse-scandal>

⁵⁰ SenseTime: <https://www.sensetime.com/other/597>

⁵¹ Face++/Megvii: <https://www.faceplusplus.com/automotive-industry-solutions>

scores with third parties. Similarly, a Tencent VP has stated that the company's WeChat app, which is used by almost every adult in China, does not 'normally' monitor users' messages or store their data remotely. However, there are three exceptions where user data may be stored and monitored: for the purposes of law enforcement, such as criminal justice; when the user is temporarily unable to receive messages, such as during a flight; and group chats, where official regulations require monitoring. Given the compulsory monitoring of group chats and the vague formulation of the first-mentioned exception, it is reasonable to assume that the government in principal has access to users' data at most or all times, despite Tencent's statement of 'normally' not monitoring conversations. Tencent has developed its own technology, PSEN ID, to desensitise personal data⁵², but it is not clear if or when data shared with the government is desensitised.

Conversely, Baidu is more receptive to the idea of sharing user data with third parties. According to Robin Li, the founder and CEO of Baidu, 'we obey a set of principles in the sense that if we think using the data will benefit the user and the user agrees that the data can be used, we'll use that'. Li also claimed that Chinese users are less concerned about their privacy: 'Chinese people are more open and less sensitive about the privacy issue. If they are able to trade privacy for convenience (or) safety for efficiency, in a lot of cases they're willing to do that'⁵³. His comments angered some media representatives and netizens⁵⁴.

⁵² 腾讯副总裁丁珂：微信不会读取、存储微信聊天记录 [Internet] Sina Tech (2017, August 15) Available: <http://tech.sina.com.cn/i/2017-08-15/doc-ifyixias1121487.shtml>

⁵³ 李彦宏：很多时候中国人愿意用隐私换取便利 [Internet] Caixin Video & Audio (2018, March 26) Available: <http://video.caixin.com/2018-03-26/101226475.html>

⁵⁴ 如何看待 2018 年 3 月 26 日李彦宏在中国发展高层论坛上表示『中国用户愿用隐私换方便和效率』? [Internet] Zhihu (2018) Available: <https://www.zhihu.com/question/269970350>

4. Academia: who does what?

4.1 Scholars have long been involved in the design of social credit

Scholars have been granted an important role in the policy formulation and other preparation for the social credit system. An early example of this was the establishment of the Peking University Credit Center more than 15 years ago. The centre launched social credit projects for the purposes of tourism, commerce and academic research, ranking participants on factors such as professional qualifications⁵⁵.

More recently, scholars and researchers have collaborated with local government agencies to design social credit policies. In 2015, The Dean of the Strategic Planning and Research Institute of Shandong Institute of Macroeconomic Research, a public service unit which has long been involved in studying the social credit system, was invited to draft the social credit system policy program in Shandong province⁵⁶.

In addition to directly being involved in drafting relevant policy documents, scholars and experts have also had an important role in collecting data that is used in planning the social credit system. Starting in 2009, scholars and experts have collaborated to design a new City Commercial Credit Environment index (officially referred to as CEI). The CEI is based on the framework of social credit and places emphasis on 'business integrity'. The index is used to annually rank China's major cities on their investment environment and the quality of government regulation⁵⁷.

Universities have also assumed the role of educating government officials on the social credit system. Professors and research staff are invited to host learning programs for officials with the purpose of dispensing professional advice. For example, in March 2018, the CCP Standing Committee in Luzhou invited a financial professor and a research director of the credit management research centre from Renmin University to guide them on preparations for social credit system construction⁵⁸.

Interestingly, but not surprisingly, there is very little public scholarly criticism and/or discussion of the social credit system project(s) and data collection in general. This is not to say that critical reflections from academia is completely absent. More likely, these are limited to various online platforms and kept from official channels. This aligns with the general tightening of censorship at universities in recent years.

⁵⁵ Life Inside China's Social Credit Laboratory [Internet] Foreign Policy (2018, April 3) Available: <http://foreignpolicy.com/2018/04/03/life-inside-chinas-social-credit-laboratory/>

⁵⁶ 专家:找准构建社会信用体系的“靶心” [Internet] Dazhong Paper (2015, March 5) Available: <http://paper.dzwww.com/dzrb/content/20150305/Article10004MT.htm>

⁵⁷ 2017 中国城市商业信用环境体检报告 (CEI) 指数在京发布 [Internet] China.com (2018, January 26) Available: <http://tech.china.com/article/20180126/20180126102739.html>

⁵⁸ 泸州邀请专家讲如何创建社会信用体系建设示范城市 [Internet] lzep.cn (2018, March 9) Available: <http://news.lzep.cn/2018/0309/267054.shtml>

4.2 Notable scholars and institutions

For the purpose of this report, a data mining study of academic articles published in China (most of them in Chinese) has been conducted, identifying approximately 4,000 articles related to the social credit system published since 2014. The metadata of these articles, including the title, abstract, keywords, authors, and funding sources, have been analysed. From this analysis, four relevant research areas have been identified: the social credit system in general; the social credit of businesses; the platforms on which credit data is shared between stakeholders; and AI and big data applications. The most published researchers in each of these fields have been listed in the following sections.

By looking at collaborations between researchers from different universities or institutions by means of a network analysis, the study revealed that a cluster of institutions producing several publications on the topic of social credit is formed by Renmin University, the Credit Reference Center of People's Bank of China, the Credit Center of Zhejiang Province, and Peking University. In addition to this cluster, Renmin University was found to have a strong relationship with the China Financial Policy Research Center, collaborating on numerous papers on the development of the social credit system and on how local governments should work with credit service institutions to strengthen the credit system.

One of the interviewed scholars holds forth Peking University and Renmin University as the two universities where most research relating to the social credit system has been conducted.

4.2.1 Social Credit (general)

Frequent keywords used in this field include 'social credit system', 'market economy', 'supervision', 'rewards and punishments', 'laws and regulations', and 'establishing and improving'.

Authors	University/Institution	Area of interest
Wu Jingmei	The School of Finance, Renmin University of China	Credit management theory and practice, three-dimensional credit theory, social credit system, credit evaluation
Zhang Zheng	School of Economics, Peking University	Credit risk, social credit system
Zhou Li	China National Institute of Standardization	Quality credit evaluation method, quality credit standardisation
Zhang Mu	School of Finance of Guizhou University of Finance and Economics	Credit risk assessment, credit evaluation, credit risk
Lu Shengyu	Guangdong Macroeconomic Information Analysis Center	Public credit, the mode of local social credit information platform construction, punishment mechanism for breach of trust
Yu Lixia	School of Business of Sichuan Normal University	The mode of social credit system construction, internet credit investigation

Table 4-1: Most published researchers in the field of social credit (general)

4.2.2 Company credit

This field of research is focused on the system of company credit, which is seen as integral to social credit. Recognising the importance of building trust, the government has already established the National Enterprise Credit Information Publicity System, intended to help citizens avoid companies with bad records. The articles related to this topic often focus on the credit management of small and medium-sized companies, which often struggle to get bank loans; the argument is that a more transparent and efficient company credit system is needed in order to facilitate the operation of SMEs. This research field can be seen as a crossroads between social and more traditional financial credit.

Authors	University/Institution	Area of interest
Lin Junyue	China Market Credit Management Association	The construction of enterprise credit archives, the design of enterprise credit management department, the management method of consumer credit
Chen Gui	China Market Credit Management Association	Market credit
Han Jiaping	Chinese Academy of International Trade and Economic Cooperation	The practice and research of enterprise credit risk management, international business credit risk management, credit risk, credit supervision
Shang Weilong	Chinese Association of Market Development	Enterprise economy
Chen Jie	Antai College of Economics & Management, Shanghai Jiao Tong University	Consumer behaviour analysis
Shi Xiaojun	School of Economics and Management, Beihang University	Commercial credit, social credit system
Chen Jing	Suzhou Vocational University Business Department	Enterprise credit management construction, credit management of small and medium-sized enterprises

Table 4-2: Most published researchers in the field of company credit

4.2.3 Collection and sharing of data

This research cluster is focused on the ways in which data is being collected and shared on different platforms. The government is building data-sharing platforms providing access for both individuals and enterprises to check their own credit information.

Authors	University/Institution	Area of interest
Wang Ningjiang	Zhejiang Economic Information Center	Personal credit construction, the boundary of public credit information, public credit data management
Lian Weiliang	National Development and Reform Commission	Social credit construction
Wang Bohan	National Information Center	National credit information sharing platform construction
Li Shifan	Inner Mongolia Institute of Standardization	Social credit system, credit information sharing, construction of standardisation

Table 4-3: Most published researchers in the field of collection and sharing of data

4.2.4 AI & big data

This cluster is formed by research related to the role of big data and AI technologies in constructing social credit systems. It also includes other topics such as balancing 'privacy' and 'security' in the context of AI and big data.

Authors	University/Institution	Area of interest
Liu Xinhai	The Institute of Digital Finance of Peking University	Credit risk management, data mining and financial big data.
Feng Wenfang	School of Economics and Management, Lanzhou University of Technology	Big data and social credit system construction
Yi Changliang	China Development Research Institute	Innovation of science and technology of social credit system construction
Wu Xiaoling	The PBC School of Finance, Tsinghua University	Application of big data, personal data protection, social credit market
Liu An	Hubei Academy of Scientific and Technical Information	Mechanism and system construction of big data of social credit
Xie Linquan	Jiangxi University of Science and Technology	Personal credit risk evaluation

Table 4-4: Most published researchers in the field of AI & big data

5. Government: who does what?

5.1 Key government organisations, roles and major policy documents

On the national level, the responsibility for designing and implementing the social credit scheme rests on the relevant government bodies. The governmental institutional infrastructure related to the social credit system, outlined in Chapter 2.2, will be described in more detail in this chapter.

In formulating policies and setting standards, the government must also follow the requirements of the Communist Party. The broad framework is created by the State Council, which sets the agenda and identifies longer-term goals. In 2014, the State Council published a blueprint document called the 'Plan for Establishing a Social Credit System'. The project is monitored by the Central Leading Small Group⁵⁹ for Comprehensively Deepening Reforms, which is headed by Xi Jinping himself⁶⁰.

In accordance with a decision by the above-mentioned Central Leading Small Group, the National Development and Reform Commission (NDRC), along with the People's Bank of China, have been tasked with leading the implementation process. These institutions are in charge of different aspects of designing and implementing the social credit system. The NDRC is focused on improving the regulatory environment and ensuring that government agencies are cooperating to effectively administer rewards and punishments in the social credit framework⁶¹. It has also been bestowed with the responsibility to approve provincial and municipal plans for social credit schemes before their implementation⁶².

Meanwhile, the People's Bank of China is in charge of establishing the data platforms for personal and enterprise credit information. The Credit Reference Center of the People's Bank of China, established in 2004, is set to become a key authority on issuing credit ratings under the national social credit system. Its ratings are already being used to aid government agencies in administrative decisions⁶³.

In addition, a coordinating body called the Interministerial Conference on Social Credit System Construction was established in 2007. Today, the body includes 46 party and government agencies, including several key ministries such as the Ministry of Public Security and the Central Propaganda Department⁶⁴.

⁵⁹ The term 'Central Leading Small Group' refers to a coordinating body set up under the Politburo of the Communist Party of China for leading policy formulation involving different bodies from the party, the government, and/or the military.

⁶⁰ Central Planning, Local Experiments. The complex implementation of China's social credit system [Internet] Mercator Institute for China Studies (2017, December 12) Available: <https://www.merics.org/en/china-monitor/content/5071>

⁶¹ China improves credit blacklisting mechanism to avoid undue punishment [Internet] Xinhua (2018, March 6) Available: http://www.xinhuanet.com/english/2018-03/06/c_137020082.htm

⁶² Orwell's Nightmare: China's Social Credit System [Internet] The Asan Institute for Policy Studies (2017, February 28) Available: <http://en.asaninst.org/contents/orwells-nightmare-chinas-social-credit-system>

⁶³ China's social credit system [Internet] Mercator Institute for China Studies (2017, May 24) Available: https://www.merics.org/sites/default/files/2017-09/China%20Monitor_39_SOCS_EN.pdf

⁶⁴ Central Planning, Local Experiments. The complex implementation of China's social credit system [Internet]

Date of publication	Policy document	Releasing institution
Jun 2014	Plan for Establishing a Social Credit System (2014-2020)	State Council
Jul 2014	Guiding Opinions on the Promotion of Fair Market Competition and Upholding the Normal Market Order	State Council
Dec 2014	Division of Tasks for the Social Credit System Construction Plan	NDRC, PBOC
Dec 2014	Three Year Key Tasks in the Construction of the Social Credit System (2014-2016)	NDRC, PBOC
Jun 2015	Comprehensive Plan for Introducing a Unified Social Credit Number System for Legal Entities and other Organizations	NDRC, State Commission Office of Public Sectors Reform, Ministry of Civil Affairs, etc.
Oct 2015	Opinions on the Implementation of Negative Lists for Market Access	State Council
Apr 2016	Several Opinions on the Employment of Big Data to Strengthen Services for and Supervision of Market Entities	State Council
Jun 2016	Guiding Opinions on Establishing a System of Incentives for Honest Behaviour and Punishments for Dishonest Behaviour Accelerating and Improving Social Trust	State Council
Jul 2016	Reform of the 'Five in One, One Code for One License' Registration System	State Council
Jul 2016	Credit Information Catalogue of the National Credit Information Sharing Platform	NDRC
Dec 2016	Guiding Opinions on Strengthening the Building of the Personal Honesty System	State Council

Mercator Institute for China Studies (2017, December 12) Available: <https://www.merics.org/en/china-monitor/content/5071>

January 2017	Action Plan for Joint Punishment on Dishonest Subjects in Sectors of E-commerce and Sharing Economy	NDRC
May 2017	Guiding Opinions of the General Office of the State Council on Accelerating the Advancement of the Reform of Integrating Multiple Certificates and Licenses into One Consolidated Business License	State Council
May 2017	Implementing Measures for Jointly Imposing Penalties on Dishonesty in the Work Safety Sector	State Administration of Work Safety
March 2018	Notice on Disciplinary Measures Restricting Real Estate Transactions by Dishonest Persons	NDRC, Supreme People's court, Ministry of Land and Resources
March 2018	Notice on Giving Full Play of the Credit Service Institutions in Speeding up the Construction of Social Credit System	NDRC
May 2018	Opinions on Appropriately Limiting the Serious Dishonest Persons to Take Civil Aircraft within A Certain Period to Promote the Construction of Social Credit System	NDRC

Table 5-1: Major guidance and implementation documents on the Social Credit System by key government entities⁶⁵⁻⁶⁶

5.2 Concretisation and implementation on a lower level

It is not clear whether, or when, there is going to be one central system for integrating the data and calculating a social credit score of every individual. According to Rogier Creemers, a scholar at Leiden University, implementing a unified system from above would be practically impossible. Instead of a unified system, Creemers believes the social credit system will assume the form of an ecosystem. Official plans do envision a central system; the intention is to start constructing the system sectorally, beginning from local levels or focus industries, and eventually establishing a centralised national system. However, only time will tell how long that process will take or if it will be practically possible.

Initially, the social credit scheme will be implemented by lower-level actors, such as provincial or municipal governments and companies. As a consequence of this decentralised implementation, citizens will live in very different systems depending on where they happen to live. Later on, there are plans to establish a national platform, controlled by the central government, which would merge the data collected by various lower-level actors⁶⁷.

⁶⁵ 中央政策法规 [Internet] creditchina.gov.cn (2018) Available:

<https://www.creditchina.gov.cn/zhengcefagui/zhengcefagui/zhongyangzhengcefagui1>

⁶⁶ China's social credit system [Internet] Mercator Institute for China Studies (2017, May 24) Available:

https://www.merics.org/sites/default/files/2017-09/China%20Monitor_39_SOCS_EN.pdf

⁶⁷ China's social credit system [Internet] Mercator Institute for China Studies (2017, May 24) Available:

https://www.merics.org/sites/default/files/2017-09/China%20Monitor_39_SOCS_EN.pdf

A similar pattern can be observed in the plans for implementing the social credit system in the industry. The goal is to eventually achieve a social credit system encompassing the whole economy. However, the focus is initially on a few key sectors that are regarded as significant for reasons of economic strategy or basic service provision; e-commerce is identified as a core focus point which will be amongst the first to come under a social credit system. After the system has been successfully implemented in these key industries, it is expected to be expanded into other sectors⁶⁸.

<i>Table 7-2: Examples of sectoral policy documents.</i> The below table shows examples of policy documents related to the implementation of China's social credit system in different sectors. ⁶⁹ Date of publication	Policy document	Releasing institution
Nov 2014	Guiding Opinions on the Construction of China's Logistics Industry Credit System	NDRC, Ministry of Transportation, Ministry of Commerce, etc.
Jan 2015	China's Insurance Industry Credit System Construction Plan 2015-2020	China Insurance Regulatory Commission, NDRC
Mar 2015	Opinions on the Implementation of the Foreign Currency Exchange Credit System	State Administration for Foreign Exchange
May 2015	Several Opinions on the Strengthening of the Construction of the Credit System in China's Transport Industry	Ministry of Transportation
May 2015	Plan for Establishing China's Automobile Industry Credit System (2015-2020)	China Association of Automobile Manufacturers
Jul 2015	Guiding Opinions on Promoting Healthy Development of Internet Finance	PBOC, MIIT, Ministry of Public Security, etc.

⁶⁸ China's social credit system [Internet] Mercator Institute for China Studies (2017, May 24) Available: <https://www.merics.org/sites/default/files/2017->

⁶⁹ China's social credit system [Internet] Mercator Institute for China Studies (2017, May 24) Available: https://www.merics.org/sites/default/files/2017-09/China%20Monitor_39_SOCS_EN.pdf

Nov 2015	Guiding Opinions on Strengthening the Construction of an Environmental Credit System for Companies	Ministry of Environmental Protection, NDRC
Jan 2016	Several Issues on the Establishment of an Intellectual Property Social Credit System	State Intellectual Property Office
Dec 2016	Opinions on Implementing an Energy Industry Credit System	National Energy Administration
Jan 2017	Guiding Opinions on Trust-building in the Field of E-commerce	NDRC, PBOC, Cyberspace Administration of China

5.3 Pilot cities and provinces

Twelve municipalities have been designated as pilot cities for the social credit system: Hangzhou, Suzhou, Nanjing, Xiamen, Chengdu, Suqian, Huizhou, Wenzhou, Weihai, Weifang, Yiwu, and Rongcheng.

In order to participate in the pilot scheme, the China National Development and Reform Commission requires the cities to satisfy five requirements:

1. Establishing a public credit information sharing platform, collecting the public credit information, and submitting it to provincial and national credit information sharing platforms.
2. Building a city credit web portal and establishing a public credit information service centre to provide information to the public.
3. Establishing standards and management methods to encourage trustworthiness and punish dishonesty.
4. Innovating credit applications and providing preferential treatment for trustworthy citizens through various channels.
5. Establishing a strong organisation for leading and supervising the implementation of the social credit system.

Some of the pilot cities are detailed in the case study sections below.

5.3.2 Rongcheng

Rongcheng has been described as the most advanced local version of the social credit system. The focus is on community-building and encouraging citizens to feel ownership of the system. There are three key elements to the social credit system in Rongcheng: a systematic credit management platform, a grading system, and a reward and punishment system.

Systematic credit management platform

The social credit office in Rongchang has set up a platform with four separate databases: an ID number-based database of local residents, a database of party and government agencies, a database of social corporations based on the unique social organisation codes assigned to them, and a region-based database of the villages in the municipality. Moreover, the Rongcheng platform cooperates with 142 government departments, covering all residents and their economic and social activities.

Grading system

The Rongcheng platform uses the collected credit information to build a dynamic grading system for both individuals and companies. Government departments have listed over 150 ways to gain social credit and more than 570 ways to lose it. The government has also introduced two third-party credit service agencies to create an independent grading system for local companies.

Rewards and punishments

The Rongcheng government has set up a credit fund to directly reward high-scoring people in the social credit system. The Rongcheng city credit office has also signed agreements with more than 20 departments of the municipal government. The collaboration has led to joint punishment agreements in 40 industries such as medicine, food safety and environmental protection. Each department will use the systematic credit management platform to inform other departments in cases of violations or 'untrustworthy' behaviour.

The stated purpose of the system of rewards and punishments is to instil a feeling of community and to inspire interpersonal trust. A local district chief, Chen Shifeng, claims: 'After the implementation of credit scores, there are increasingly good people and good deeds. For instance, people help the neighbors to pick up the kids or pick up rubbish on the road.'⁷⁰

A sectoral case study is provided by the fishing industry in Rongcheng. As part of the social credit pilot scheme, the municipal government has established a fishing credit platform to monitor more than 1,000 shipowners and more than 3,000 individual crew members. By August 2017, the government had issued 144 individual rewards and 509 individual administrative punishments. High-scoring shipowners enjoy privileges such as priority treatment for bank loans and fuel subsidies. Conversely, shipowners with a low grade are punished by restrictions on funding and bank loans and other penalties.

5.3.3 Nanjing

The Nanjing social credit information office has built a credit information platform containing

⁷⁰ “诚”市发现, 荣成: 当信用沁入一座城 [Internet] Credit of Shanxi (2018, January 29) Available: <http://www.creditsx.gov.cn/xyyj/3365987.jhtml>

the information of 11 million residents and 460,000 enterprises.⁷¹ The office cooperated with 51 credit intermediaries to set up the platform⁷². It has also signed data exchange agreements with other governmental departments including police and tax bureaux to facilitate data-sharing.

Social credit cards

In 2016, Nanjing released the first social credit cards for 14,000 citizens with high social credit. These credit cards are intended to be a form of reward for good citizens; people with a high social credit rating can change their citizen cards into social credit cards. They offer benefits such as discounts for public transport, libraries and museums as well as preferential treatment in some financial institutions and public facilities. People with high social credit ratings can be recommended for the social credit card by different departments⁷³. Assessment criteria include whether an individual is donating blood and whether he or she is a 'model worker'⁷⁴.

5.3.4 Hangzhou

The Hangzhou social credit office is a union headed by the Development and Reform Commission of Hangzhou and consisting of members from 71 different government departments and social organisations.⁷⁵ The office started to implement its social credit platform in 2008; to date, it has gathered the credit information of 13 million citizens and 1.2 million companies⁷⁶.

Citizen cards

The Hangzhou social credit office has connected credit scores with the citizen cards, or social insurance cards, issued to residents. The purpose is to facilitate the calculation of credit scores according to trustworthy or untrustworthy behaviour. Individuals with high-rated citizen cards can enjoy preferential treatment in public facilities, such as hospitals, and financial institutions, such as the Bank of Hangzhou.

The Hangzhou government has also launched an application called 'Credit Hangzhou', which allows individuals to easily check their credit information. The social credit office cooperates with the Credit Hangzhou Promotion Association, comprising of 52 members from various institutions such as credit management companies, financial technology companies,

⁷¹ 如何运用大数据推动诚信体系建设? [Internet] NetEase (2017, May 4) Available:

<http://news.163.com/17/0504/07/CJIT2AEP000187VI.html>

⁷² 南京信用中介机构 [Internet] Credit of Nanjing (2017, April 4) Available:

http://www.njcredit.gov.cn/xyzz_79563/zjjg_79807/

⁷³ 关于为南京“诚实守信好市民”提供优质优惠金融服务的公告 [Internet] Xinhua Paper (2017, June 28) Available:

<http://xh.xhby.net/mp3/pc/c/201706/28/c342661.html>

⁷⁴ 南京市“市民诚信卡”上线运行 [Internet] Nanjing Government (2016, October 24) Available:

http://www.nanjing.gov.cn/xxgk/sydw/xxzx/201610/t20161024_4228944.html

⁷⁵ 关于调整杭州市信用杭州建设领导小组成员的通知 [Internet] Credit of Hangzhou (2018, January 22) Available:

<http://www.hzcredit.gov.cn/home/organization.html?parent=3&menu=4>

⁷⁶ 杭州荣获全国首批社会信用体系建设示范城市 [Internet] Hangzhou.com.cn (2018, January 10) Available:

http://hznews.hangzhou.com.cn/chengzshi/content/2018-01/10/content_6769141.htm

universities and research institutions⁷⁷. The Credit Hangzhou scheme enables citizens to use their credit scores for activities such as hiring services or booking hotels without paying deposits⁷⁸.

5.3.5 Suzhou

The Suzhou government has built a credit database encompassing enterprises and individuals. It has also established an online social credit portal with a public search function.

Osmanthus score

Suzhou has cooperated with Ant Financial to launch an evaluation system called Osmanthus score, named after the official flower of the city. The system is based on the massive database of personal credit information collected by the government. It utilises third-party data, big data analysis and model calculation to allocate quantitative credit scores for the 13 million residents of Suzhou. People with high scores can enjoy daily benefits such as using public buses and borrowing books from libraries for free⁷⁹.

5.2.6 Guizhou

Guizhou has, together with Henan, been designated as a pilot for integrating big data with social credit on provincial level⁸⁰.

Guizhou Credit Cloud

In June 2017, Guizhou province established a public credit information platform called 'Credit Cloud', integrating new technologies such as cloud computing and big data. The Credit Cloud concurrently set up 4 public credit databases and connected with the national platform for sharing credit information.

By March 2018, the Guizhou Credit Cloud has gathered the credit information of over 7 million individuals and companies, comprising more than 81 million units of credit information. The platform has also shared more than 10 million units of credit information with the national credit information platform. The goal of the platform is to be the basis for a more comprehensive nationwide platform for sharing credit information.

Taxation Credit Cloud

Under the Credit Cloud platform, a sub-platform called Taxation Credit Cloud builds user profiles and provides customized services to public and financial institutions based on the massive data it has accessed from government departments. Aided by big data, the Taxation

⁷⁷ 芝麻信用等六单位发起 杭州市信用杭州促进会正式成立 [Internet] hangzhou.zjol.com.cn (2018, June 15) Available: http://hangzhou.zjol.com.cn/jrsd/bwzg/201806/t20180615_7549858.shtml

⁷⁸ 杭州荣获全国首批社会信用体系建设示范城市 [Internet] Hangzhou.com.cn (2018, January 10) Available: http://hznews.hangzhou.com.cn/chengshi/content/2018-01/10/content_6769141.htm

⁷⁹ 苏州市入选全国首批社会信用体系建设示范城市 [Internet] suzhou.gov.cn (2018, January 10) Available: http://www.suzhou.gov.cn/news/szxw/201801/t20180110_946186.shtml

⁸⁰ 贵州获批建设社会信用体系与大数据融合发展试点省 [Internet] State Council of China (2017, December 15) Available: http://www.gov.cn/xinwen/2017-12/15/content_5247212.htm

Credit Cloud can also accept and process direct loan applications from people and companies in less than 3 minutes.

5.3.6 The case of Xinjiang

The Xinjiang autonomous region is not part of any pilot scheme for the social credit system. However, some observers have drawn parallels between the social credit system and the government's use of data analysis tools there to enhance social monitoring and, subsequently, strengthen its ongoing security crackdown in the region. The case of Xinjiang is in this way used a warning example of what kind of society excessive use of data analysis for security purposes can lead to.

In 2016, the Xinjiang Bureau of Public Security established the Integrated Joint Operations Platform (IJOP), a new security operation which integrates new surveillance technologies such as facial recognition CCTV cameras and IP-detecting 'Wi-Fi sniffers'⁸¹. Hikvision and Dahua, two tech startups developing video surveillance systems (see also Section 5), have together received orders worth 7 billion yuan for security projects in Xinjiang. For example, Hikvision will supply around 1,000 cameras monitoring the entrances of mosques, according to media reports in July 2018.⁸²

This development has prompted some critics, including the Human Rights Watch, to express concern about the possible exacerbation of existing human rights concerns. According to Maya Wang, senior China researcher at HRW, '[f]or the first time, we are able to demonstrate that the Chinese government's use of **big data and predictive policing** not only blatantly violates privacy rights, but also enables officials to arbitrarily detain people'⁸³.

⁸¹ China: Big Data Fuels Crackdown in Minority Region [Internet] Human Rights Watch (2018, February 26) Available: <https://www.hrw.org/news/2018/02/26/china-big-data-fuels-crackdown-minority-region>

⁸² China steps up surveillance on Xinjiang Muslims [Internet] Financial Times (2018, July 18) Available: <https://www.ft.com/content/c610c88a-8a57-11e8-bf9e-8771d5404543>

⁸³ China: Big Data Fuels Crackdown in Minority Region [Internet] Human Rights Watch (2018, February 26) Available: <https://www.hrw.org/news/2018/02/26/china-big-data-fuels-crackdown-minority-region>

6. Key takeaways

This report has highlighted the following aspects of the social credit system in China and related developments:

- There is today no clear picture of what a national social credit system will look like when and if fully implemented. The current situation is better described as set of different lower-level programs with limited connection between them.
- The system builds on a foundation of existing systems and the incremental adoption of real-name registration in a growing number of areas over the last decade, as well as technical innovations that simplify management and analysis of large amounts of data.
- The broad framework for the social credit system is created by the State Council, but stakeholders also include ministries and government agencies on different levels. The project is monitored by the Central Leading Small Group for Comprehensively Deepening Reforms, which is headed by Xi Jinping himself.
- Twelve municipalities have been designated as pilot cities for the social credit system, experimenting with different aspects of the system. Some of the pilots have caused alarm among the public, while others are considered relatively successful.
- Startups and high-tech companies have a prominent role in the development of the social credit system, and in AI and big data applications overall. SenseTime, Megvii, and CloudWalk are example of companies that do not only have strong ambitions in AI, but are simultaneously contributing to automated monitoring and surveillance.
- Academia is highly involved in designing systems of social credit. Renmin University and Peking University, for example, are collaborating with the Credit Reference Center of People's Bank of China and the Credit Center of Zhejiang Province. Research activity has been found in four related research areas: the social credit system in general; the platforms on which credit data is shared between stakeholders; the social credit of businesses.



**CONSULATE GENERAL
OF DENMARK**
Shanghai

**INNOVATION
CENTRE
DENMARK**

Innovation Centre Denmark

It is the aim of Innovation Centre Denmark to strengthen research, innovation and higher education in Denmark and to promote Denmark as a leading knowledge society. The Danish innovation centres can provide you with access to knowledge, technology and networks in selected global leading research, education and innovation environments. Innovation Centre Denmark in Boston, Munich, New Delhi/Bangalore, Sao Paolo, Seoul, Shanghai and Silicon Valley are established in cooperation between the Ministry of Foreign Affairs and the Ministry of Higher Education and science. More information: www.icdk.dk.