Artificial Intelligence and Cybersecurity in the Czech Republic

czech taiwanese

business chamber

Introduction

Artificial Intelligence and Cybersecurity are currently the most dynamic and booming industries in the Czech Republic. Especially Prague and Brno, the two largest cities in the Czech Republic, are home to both startups and huge enterprises with big impact worldwide and diverse teams of top-notch international talent. Cybersecurity has a long tradition in the Czech Republic thanks to its innovative environment and Avast, whose history goes way back to 1988 is probably the most famous company for personal cyber-security applications. However, Czech Republic has also produced home-grown advanced cybersecurity solutions for business and military uses that rely on advanced AI approaches such as Intelligent Agents.

Academic and Research Institutions

The primary motor of growth in AI and Cybersecurity is local academic research, which has borne many fruits in recent years and has directly contributed to the formation of numerous new companies. The Czech Technical University in Prague currently hosts various famous scientists in the fields of AI and Cybersecurity. Tomas Mikolov, former AI Researcher at Facebook is known as the author of the famous Word2Vec, an algorithm used in Natural Language Processing. Professor Michal Pechoucek, currently the director of Avast, is well known for research in Multi-Agent Systems and has had successful exits from other cybersecurity companies in the past as well, namely Cognitive Security which was bought by Cisco. He cofounded Cognitive Security with Martin Rehak. Martin Rehak is the current head of Resistant AI. Jan Sedivy, who has worked for IBM and Google, is an NLP researcher and holds various patents. He founded a student incubator that led to the formation of companies such as Rossum. He also leads a winning team behind Amazon Alexa called Alquist that has won multiple medals in the Alexa Prize. Professor Vladimir Marik is one of

the founders of AI/Cybernetics research in the Czech Republic and a current head of The Czech Institute of Informatics, Robotics and Cybernetics. He is also a director of Certicon, a software company. The late Ivan Havel, brother of President Havel, was one of the first researchers in Cybernetics in the Czech Republic. Professor Jiri Matas, a head of Center for Machine Perception at CTU has an excellent track record in the field of computer vision research.

In recent years, Czech Technical University has had an incredible impact on the development of new successful companies in the fields of AI and Cybersecurity. Other major universities with research in Artificial Intelligence are Charles University in Prague and Masaryk University in Brno. Both universities bring excellent contributions in Artificial Intelligence fields such as Natural Language Processing. Charles University has a long tradition of Computational Linguistics and houses the Institute of Formal and Applied Linguistics. Professors Eva Hajicova and Jan Hajic have made long-standing significant contributions to (computational) linguistics research.

The Czech Institute of Informatics, Robotics and Cybernetics (CIIRC CTU)

As a major and prestigious Research Centre at Czech Technical University in Prague, CIIRC's areas of expertise include: automatic control and optimization, robotics, artificial intelligence, computer graphics, computer vision and machine learning, designing software systems, designing decision and diagnostic systems and their applications in medicine, energy transport, including smart homes and smart cities.

CIIRC also serves as headquarters of the National Center for Industry 4.0. Primarily for the advanced development and transfer of technologies and solutions for Czech small and medium-sized companies. CIIRC is home to several world-renowned scientists such as Tomas Mikolov, Vladimir Marik, Jan

Sedivy or Zdenek Hanzalek. The teams have won various international AI contests. For instance, Amazon is currently using the Alquist team's social bot, a Gold medal winner of Amazon's Alexa Prize competition. Their Natural Language Understanding conversational solution was among the winners several times in a row.

Institute of Formal and Applied Linguistics

The Institute of Formal and Applied Linguistics (UFAL) is a department at the Faculty of Mathematics and Physics at Charles University in Prague. UFAL has focused on the research of Computational Linguistics since the early 60s in various forms and is host to many research projects both nationally and internationally. Its research also includes modern Natural Language Processing approaches such as machine translation. UFAL also manages Czech language corpora used for research.

Center for Machine Perception (CMP)

The Center for Machine Perception (CMP) comprises world-renowned scientists who share common interests in computer vision, pattern recognition, machine learning, and autonomous robotics from the following groups: biomedical imaging algorithms, machine learning, vision for robotics and autonomous systems, visual recognition, applied algebra and geometry and robot perception.

Taiwan needs to boost the negotiations on the EU-Taiwan Investment Agreement. In the absence of TPP and the EU Japan deal to be concluded soon, Taiwan could be side lined. A comprehensive agreement that would address market access issues could provide the necessary stimulus or justification for some of the badly needed reforms in Taiwan. Reducing distortions caused by multiple standards and product testing requirements, as well as extensive food-labelling and certification requirements, would lower costs for Taiwanese

companies, exporters included, and benefit Taiwanese consumers. The FTA is a must, and unfortunately, it is still far away on the horizon.

Investment Funds

MITON

MITON is a group of entrepreneurs operating from the Czech Republic and focusing on Central and Eastern Europe. They have traditionally focused on consumer facing businesses, marketplaces and e-commerce and now put a great deal of emphasis on AI and crypto startups. Their current portfolio is worth 200 million Euros. MITON is behind companies such as Bonami, Rossum, Glami, Biano, Slevomat and Heureka.

Credo Ventures

Credo Ventures is an investment fund focusing on Central European technology founders with 170 million Euros of assets under management. Credo focuses on seed and series A investments between 50k and 10M Euros.

Selected companies in Artificial Intelligence

Rossum

Rossum is an AI-based cloud document gateway for automated business communication. Rossum solves four key steps in document-based processes at once: receiving documents across multiple channels, automated understanding, two-way communication to resolve exceptions, and acting on the data using in-depth integrations. Invoices, purchase orders, claims, or any other documents, Rossum successfully automates the whole business communication.

Rossum has recently attracted $100 million in Series A investment from an elite fund, General Catalyst, one of the largest single investments in Central and Eastern Europe. Rossum was founded by three students of the Czech Technical University and has seen a 5 fold growth in revenue during the past year.

Key areas:

Artificial Intelligence | Document Management | Machine Learning | SaaS | Software

Neuron Soundware

Neuron Soundware is a deep tech startup in AI and IoT using audio analysis to detect broken machines. Neuron soundware develops a detection system that detects machine problems. By recording audio data via sensors and the subsequent automatic evaluation, failures or abnormal behaviors of machines are detected and production breakdowns are prevented. Neuron soundware is an AI company using sound recognition for predictive maintenance.

Key areas:

Artificial Intelligence | Information Technology | Internet of Things | Machine Learning | Predictive Analytics | Software

GoodVision

GoodVision helps transport surveyors and modellers to achieve incredible productivity in traffic data analytics by providing an advanced traffic analytics platform via artificial intelligence.

GoodVision's solution - the "Video Insights" platform - is the ultimate B2B SaaS traffic analytics platform automating traffic data collection from existing camera infrastructure and providing deep traffic analytics for traffic model

calibration. GoodVision captures traffic insights from activity on roads in the form of multi-purpose digital data and allows for collaboration to obtain crucial traffic parameters fully interactively. They are re-imagining the collaboration between traffic surveyors, transport planners and smart cities. Video Insights is a comprehensive ecosystem of features which saves traffic modellers up to 95% of their time by automating the traffic model creation and calibration. Modellers perform interactive analyses over the digitally extracted traffic data and automatically generate traffic model networks for PTV Vissim and AIMSUN systems. It allows the computing of a wide variety of traffic behavioural analyses, including speed and saturation flow computation, to calibrate and verify the traffic models without the substantial manual efforts needed by conventional methods.

Key areas:

Analytics | Artificial Intelligence | Big Data | Computer Vision | Data Visualization Machine Learning | SaaS | Smart Cities | Transportation

SpaceKnow

SpaceKnow empowers decision-makers with ultra large-scale planetary analysis. SpaceKnow is a Silicon Valley venture capital backed startup that brings transparency to the global economy by tracking global economic trends from space. They develop products for monitoring economic activity for a wide variety of both consumer and enterprise clients.

Key areas:

Aerospace | Analytics | Artificial Intelligence | Big Data

Comprimato

Comprimato provides GPU accelerated storage compression and video compression solutions for media & entertainment and geospatial imagery technology company's. Their goal is to commodify the software processing of Ultra HD 8K and 360/VR videos.

Comprimato team pioneered research in the field of video compression algorithms for parallel GPU architecture. They continue to push the boundaries of today's GPUs to deliver even faster compression solutions.

Key areas:

Data Storage | Digital Media | GPU | National Security | Software | Video | Virtual Reality

Yieldigo

Yieldigo is a customer-Centric AI Price Optimization for Retailers. Retailers can benefit from AI-based price optimization that is focused on their customers. Yieldigo helps retailers such as supermarkets, drugstores, and pharmacies to set optimal non-promotional prices to increase profitability. This is done by a proprietary machine learning algorithm that creates a model of consumers' purchasing behavior, combines it with retailers' business objectives and creates optimal prices based on both perspectives. As a result, Yieldigo creates a profit uplift for their customers of 5-15% while preserving their revenues and price index.

Key areas:

B2B | Machine Learning | Retail | SaaS

Kinalisoft

Kinalisoft is an R&D company that offers ideas and improvements to international companies on their current processes and products. Kinalisoft has always focused on companies involved in the development of advanced technologies. Kinalisoft's specialties are computer vision applications in industry. The company focuses on delivering equipment and dedicated machines for product quality control, automation of production processes and accurate and fast measurement by optical methods.

Key areas:

Computer Vision | Consulting | Information Technology | Software

Socialbakers

Socialbakers is the leading AI-powered social media marketing platform. Socialbakers leverages the largest social media data-set in the industry along with machine learning to bring audience-first social media marketing to thousands of enterprises and SMBs, including over 100 companies in the Fortune Global 500. As a trusted marketing partner, Socialbakers helps brands ensure their investment in social media is delivering measurable business outcomes. Socialbakers offices are located in New York, London, Paris, Munich, Prague and Singapore, and currently, the business employs over 400 people worldwide. Originally a Czech firm, Socialbakers was acquired by the American company Astute in September 2020.

Key areas:

Analytics | Digital Marketing | Marketing Automation | Social Media | Social Media Management | Social Media Marketing

GoodAI

GoodAI is trying to build artificial brains that can learn, be creative, and adapt to the environment in the way a human does. The company's mission is to develop general artificial intelligence, be helpful to humanity, and understand the universe. GoodAI started as a research and development initiative inside Keen Software House in January 2014, when CEO Marek Rosa invested $10M USD into the project. GoodAI was publicly announced in July 2015 and is now a team of 20 people.

Key areas:

Artificial Intelligence | Machine Learning | Software

Time is Ltd

Time is Ltd. provides an advanced analytical SaaS platform that delivers a holistic view of an organization's collaboration patterns using machine learning-based software for analysing intercompany time productivity.

The aim is to improve the everyday productivity of large corporations and companies. An easy way to integrate a solution for companies which are going through the process of adopting a diverse number of cloud tools, Time is Ltd. allows them to understand the performance data behind their productivity. Powered by machine learning, the Time is Ltd. platform brings the data from a number of tools, such as Office 365, G Suite, and Slack, amongst others, together in one. By unlocking the hidden gems in this combined data, the platform reveals a company's successful working patterns and allows organizations to operate more effectively.

Key areas:

Artificial Intelligence | CRM | Human Resources | Information Technology

Machine Learning | Robotics | SaaS | Software

Leadspicker

Machine learning is used by Leadspicker to locate all high-tech startups and technology enterprises on the internet. They have developed an advanced Natural Language Processing classifier which, through deep learning, will be able to efficiently determine whether some recently created website is the web of an innovative startup company or not. This classifier in conjunction with the advanced web crawler will be able to find most newly created startups on the global scale that are not in any database yet.

Key areas:

Computer | Electronics | Information Technology | Internet of Things | Machine Learning

Warhorse Studios

Warhorse Studios is a Czech independent development studio focused on the creation of computer games. The studio's founders are Dan Vávra, who gained notoriety with the world-famous Mafia and Mafia 2 games, and Martin Klíma, who found success with his Dračí doupě. In 2018, the studio achieved fame with Kingdom Come: Deliverance, a game set in the middle ages, which enjoyed success around the world. More than one million units were sold in a single week and sales figures for 2018 exceeded two million, while the company's revenues are estimated at CZK 1 billion.

Warhorse Studios is a video game production studio founded by veterans in the industry.

Key areas:

Consumer Electronics | Software

Kiwi.com

Kiwi.com is an online travel tech company that consists of an extensive database of more than 800 air and ground carriers worldwide. It is an online search engine allowing users to combine transportation from non-cooperating carriers. It is powered by its proprietary algorithm (Virtual Interlining) that allows users to combine flights and ground transportation from over 750 carriers, accompanied by the industry-leading Kiwi.com Guarantee. Today, the company sees more than 100 million searches every day and employs over 2,800 people worldwide. Kiwi.com ranked seventh in the 2017 Deloitte Technology Fast 500 EMEA list, becoming the highest-ever rated Czech company. Following on from this success, Kiwi.com ranked fifth in the very same program in 2018.

Key areas:

Leisure | Tourism | Travel

eParkomat

eParkomat is a unique platform that predicts parking spaces availability on and off-street in real time with 96% accuracy without additional hardware such as cameras or sensors. They achieve this by using Artificial Intelligence to process real-time Big Data analysis of mobile operators' signalling cellular networks. They have also managed to turn this raw data into valuable information for smart cities to make better public policies in terms of urban planning and mobility and for companies to attract more customers, evaluate their sites and increase sales. Some of their customers and partners include T-Mobile, the City of Prague and the VW group (Skoda Auto). Their solution can be integrated to car navigation systems, so every car manufacturer will be able to provide customers the best customer experience based on finding a parking space fast and on providing a convenient way of paying for it.

Key areas:

Artificial Intelligence | Automotive | Big Data | Commercial | Information Technology | Parking

Sewio

Sewio is a Czech based company delivering a market-proven Real-time Location Platform as a fundamental technology for the digitization of movement in Industry 4.0, retail and sport.

By highly precise indoor tracking and rich data analytics, they bring a completely new level of understanding of work-flow processes across a broad array of disciplines. They optimize flow of intra-logistics in manufacturing and reduce staff injuries. They observe customer behaviour to increase profit in retail, or they enable the boosting of performance of sport teams by analysing details of their movement during the game.

This can be achieved by delivering a fully scalable and ready to integrate Real-time Location Platform combining Decawave Ultra Wide Band radio technology with complex location data analytics. Since digitization plays a crucial role in revolutionizing industry, their Real-time Location Platform is becoming one of the key technologies enabling Industry 4.0 to become a reality.

Key areas:

Industrial Automation | Location Based Services | Real Time

Veracity Protocol

Veracity Protocol allows anyone to guarantee the identity, authenticity, and condition of physical items, combating counterfeiting, fraud, and manipulation.

Bohemia Interactive Simulations

Bohemia Interactive Simulations (BISim) is a global software company at the forefront of simulation training solutions for military and civilian organizations. BISim develops high-fidelity, cost-effective technologies for tactical military training. They apply game-based technology to a range of breakthroughs, military-specific training and simulation software products.

Key areas:

Gaming | Information Technology | Simulation | Software

Ximilar

Ximilar provides a computer vision platform with feature-rich visual search & recognition businesses. From analysing fashion items through medical images, detecting people in videos to getting visually similar products for an e-commerce project.

With Ximilar Recognition platform, you can create your custom image recognition and detection models. From setting up an account to deployment of a model in minutes.

Key areas:

Artificial Intelligence | Automotive | E-Commerce | Fashion |
Information Technology | Machine Learning | Software

ShipVio

ShipVio allows SMEs to carry small items and pallets across Europe using their network of vehicles with spare truck capacity. ShipVio allows anything to be shipped. Their customers save up to 25% of their logistic expenses thanks to the spare capacity of vehicles.

3LRobotics

For parcel delivery services using drones, 3LRobotics construct and run automated drone heliports and parcel transportation systems. 3LRobotics build and operate automated drone heliports and parcel transportation systems for parcel delivery services operated by drones. They provide solutions for homeowners, office complexes, hospitals, and other communities to receive parcels from all kinds of drones. Their drone heliports offer secure, convenient and precision landing for all types of delivery drones.

Selected companies in Cybersecurity

Semantic Visions

Semantic Visions is a software-based actionable analytics firm based in Prague and London, operating a military-grade Open-Source Intelligence (OSINT) system that collects and analyzes 90% of the world's news content. Founded in 2011, Semantic Visions runs a cross-language early warning system to protect clients from threats before they materialize. Semantic Visions is committed to safe-guarding democracy through the detection of disinformation and adversarial propaganda, and by fostering joint situational awareness of emerging events and trends.

Resistant AI

Resistant AI protects the machine learning system from adversarial manipulation and advanced fraud. They believe that responsible and systematic adoption of machine learning techniques can profoundly improve our lives. Their mission is to accompany their customers in this way and to ensure that the risks related to machine learning and AI adoption are responsibly detected,

managed and resolved. Resistant AI has recently raised $2.75 million in venture capital to develop an artificial intelligence system that protects algorithms from automated attacks.

Key areas:

Artificial Intelligence | Machine Learning | Network Security

Avast

Avast is the global leader in digital security products for consumers and businesses, and protects over 400 million people online. Avast offers products under the Avast and AVG brands, that protect people from threats on the internet with one of the most advanced threat detection networks in the world. Avast has recently gone through a merger with Norton worth $8 billion.

GreyCortex

GreyCortex is a solution for advanced network security and performance monitoring for enterprise, government and other critical infrastructure. GreyCortex Mendel employs advanced machine learning, unique detection algorithms and several more traditional detection methods for detection of both known and unknown threats.

GreyCortex Mendel differs from other solutions for Network Performance Monitoring, Diagnostics and Application Monitoring in several crucial aspects: its application awareness, identity awareness and a flow-based monitoring engine processes six times more features than NetFlow.

Key areas:

Artificial Intelligence | Computer | Government | Infrastructure |
Machine Learning | Network Security

ThreatMark

ThreatMark brings trust to the digital world by providing cutting-edge fraud prevention solutions. The company was founded with a vision of bringing trust to interactions across all digital channels through profound cybersecurity know-how and the latest advancements in AI & Data Analytics. ThreatMark processes a comprehensive set of data inputs to continuously validate the user's identity & their intentions, while protecting the user's most valuable assets.

They make sure that the entire digital journey (onboarding, authentication, account management, transactions…) is trusted and safe for both end-users and businesses.

Major banks use ThreatMark's deep behavioral profiling engine to analyze vast amounts of user specific data & behavioral traits to precisely identify legitimate users and deny fraudsters in real-time. For banks and their users, ThreatMark enables a seamless digital experience that does not require additional authentication nor rely on simple transaction monitoring. ThreatMark goes beyond the industry standards to validate more than 25 million users and over 1 billion logins and transactions yearly.

Key areas:

Banking | Cyber Security | FinTech | Fraud Detection | PaaS | Payments | SaaS

Flowmon Networks

Flowmon enables businesses to confidently manage and safeguard their computer networks. The Flowmon solution creates a secure and transparent digital environment where people rule the network regardless of its complexity and nature. Using machine learning, heuristics and advanced analytics, it

enables IT professionals to improve performance and reduce risk across on-premise, data centre and cloud environments. The solution serves as a shared platform where network and security teams speak the same language, enabling them to work as one for faster mean-time-to-resolve and optimal resource allocation. By delivering highly streamlined deployment to any network type, market-leading support and in-product guidance, the solution provides the fastest time-to-value in the industry.

Key areas:

Analytics | Cyber Security | Information Technology | Internet | Network Hardware | Network Security | Security

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