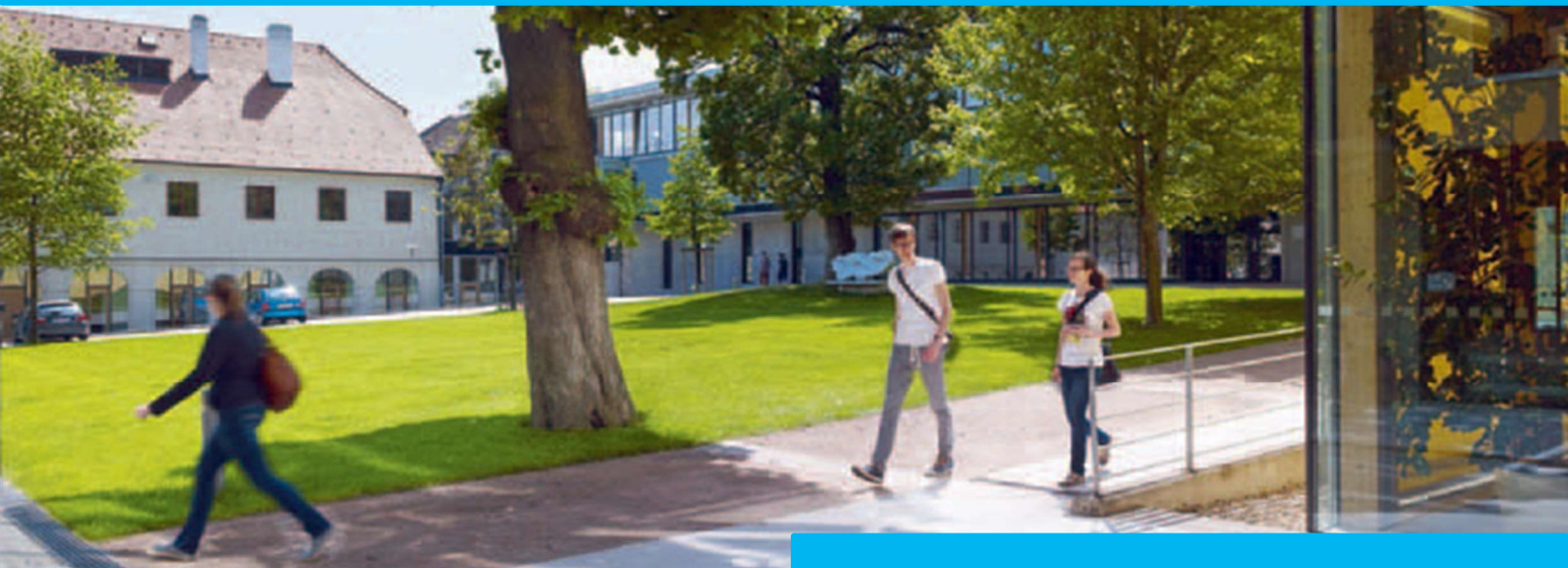


# 2021 Brno International Summer School in Information Technology



The Faculty of Information Technology of Brno University of Technology (FIT BUT), the best-rated IT faculty in the Czech Republic, opens International Summer School in IT to take place at an interesting location in the heart of Europe. The International Summer School offers courses in selected IT areas for future technology leaders. The courses have been devised by experienced academics and offer both theoretical knowledge and practical seminars with experienced lecturers. A part of the lessons is project work in small teams. The courses also include visits to technology companies and guided tours to various points of interest in Central Europe.



- Price: USD 1660
- Duration: 13 academic days
- Dates: 7 – 23 July, 2021
- Language: English
- Location: Brno, Czechia, Europe
- Eligibility: undergraduates in computer science or engineering 2-4 yr.
- Graduation: 5 ECTS credits

Students from partner universities are offered 250 USD discount on the tuition fee.

The tuition fee includes: lectures and materials, refreshments during breaks, 3 guided tours (Brno, Prague, Moravian Karst), three company excursions, and 2 social events.

**prepare for your future in IT**

# PROGRAMME

The Brno International Summer School in Information Technology offers courses in three important areas of information technology:

1. Cybersecurity and Forensics
2. Machine Learning
3. Interactive Applications, and

Students choose any of these courses. The courses cannot be combined.

## Graduation

Students who complete at least 80% of the academic program and finish course tasks or a final project of sufficient quality (50/100 at least) will receive a certificate of completion of the course worth 5 ECTS credits.



## Typical day

The timetable shown below offers an idea of a typical daily schedule, although this may vary depending on the events planned for the given day.

- 08:00-09:30 Breakfast
- 09:30-12:00 Morning academic session
- 12:00-13:30 Lunch
- 13:30-17:00 Afternoon academic session
- 19:30-22:00 Evening social event

## Excursions

The programme includes visits to two IT companies selected according to the main topics of the courses. The students will also be offered an excursion to the JIC (South Moravian Innovation Centre), which empowers entrepreneurs and businesses in all stages of development.

## Opening and Graduation Ceremonies

The opening ceremony takes place the very first day of the course. A common inaugural dinner will be held so that the students have an opportunity to get to know each other better.

The final evening of the programme celebrates the achievements of each participant in a graduation ceremony followed by a gala dinner.

**best-rated IT faculty in the Czech Republic**

# 1) CYBER SECURITY AND FORENSICS

## Summary

The course introduces students to the basics of filesystems, operating systems, and their use in the area of digital forensics. They will learn essential cybersecurity principles and incident response techniques. Moreover, the attendees will try out various attacks, their detection, and how to create countermeasures.

## Key outcomes:

- Understanding fundamental concepts of cybersecurity and digital investigation
- Learning how to acquire a forensic image and examine filesystems, OS and data
- Gaining skills for incident responses and forensics with real-world cybersecurity case studies
- Learning essentials of cryptography, password protection, and cracking
- Getting hands-on experience to develop skills via open-source security tools
- Try out real cyber attacks in a lab environment and learn how to protect your system against such attacks

## Guarantor



**Ondřej Ryšavý, doc. Ph.D.**

Ondřej Ryšavý is a leader of the NES@FIT research group that specializes in cybersecurity and digital forensics. He has led numerous R&D projects and conducted collaboration with industrial partners in the area of system and network security, in particular, security network monitoring, threat detection, and industrial system cybersecurity.

## Lecturers

Ondřej Ryšavý, Radek Hranický, Kamil Jeřábek, and Ivan Homoliak

# 1) CYBERSECURITY AND FORENSICS

# 2) MACHINE LEARNING

## Summary

Students will get a broad perspective on the latest topics in machine learning and they will gain solid practical foundations to be able to solve advanced problems on their own. They will learn general data processing and machine learning methods, focusing on practical implementation in Python. The students will also learn general concepts of deep learning, including convolutional and recurrent networks. Lectures will also focus on specific state-of-the-art approaches in object and scene understanding from images, speech recognition and speaker identification, as well as language modelling and understanding

## Guarantor



**Lukáš Burget**, doc. Ph.D.

Lukas Burget, an assistant professor at FIT BUT and the research director of the BUT Speech@FIT group, is interested in speech data mining, concentrating on acoustic modelling for speech, speaker and language recognition, including the respective software implementations. Besides his achievements in EU- and US-funded projects (US-Air Force EOARD, IARPA BEST etc.), he is a distinguished lecturer in classification and recognition courses.

## Key outcomes:

- Gaining practical understanding of basic concepts of machine learning and data processing
- Being able to use convolutional and recurrent networks in practical applications
- Understanding basic concepts of computer vision
- Understanding the structure and parts of a speech recognition pipeline
- Understanding how words are represented in natural language processing methods
- Being able to extract semantic information, from text
- Experiencing how practical problems can be solved by machine learning in a team project

## Lecturers

Lukáš Burget, Michal Hradiš, Lukáš Sekanina, Martin Fajčík, and Karel Veselý

# 2) MACHINE LEARNING

# 3) INTERACTIVE APPLICATIONS

## Summary

The students will learn about the importance of user interfaces for efficient computer usage. They will be acquainted with basic principles and structure of applications and user interface development tools, master various aspects of the UI design process: from design thinking and user-centred design, to architecture design of web applications. Participants will practice their skills with modern development tools and technologies, design and develop a functional web application, and develop their presentation and teamwork skills.

## Key outcomes:

- Understanding of the bigger picture by studying the past, present, and future of user interfaces and human-machine interaction
- Understanding the design process focused on human-centred design
- Critically analysing contemporary websites, learning how they are built and deployed
- Understanding information system architecture
- Learning to design and develop front-end web applications based on classic and modern technologies
- Completing a team project that builds on multiple syllabus criteria

## Guarantor



**Adam Herout**, prof. Ph.D.

Prof. Adam Herout leads the Graph@FIT research group. His research interests are centred around computer vision, especially traffic surveillance. He is active in the start-up world and co-founded a few start-ups by himself. That led him to his interest in customers and users, in user experience, and in usability of IT services. Besides his education in information technology, specifically in computer graphics and computer vision, he took courses in group psychotherapy and Gestalt coaching.

## Lecturers

Adam Herout, Vita Beran, Radek Burget, Libor Polčák, Jarek Dytrych, and Jan Pluskal

# 3) INTERACTIVE APPLICATIONS



# BRNO CITY – SOUTH MORAVIA REGION



Brno frequently comes among the top places to live in as ranked by foreign newspapers such as the New York Times. It also made it into the top five student cities of the world as recently published by the renowned QS!

In recent years, Brno has become a dynamic knowledge hub and innovation centre in Central Europe. It gives you a unique chance to cooperate with local world-class institutions, teams, as well as companies, and get a great experience.

Or you can just explore the Czech Republic or the South Moravia Region – mountains, forests, lakes, historical monuments, and vineyards within an easy reach.

The Czech Republic is the 6<sup>th</sup> safest country in the planet.



## CZECH REPUBLIC

# GUIDED TOURS

The tuition fee covers 3 guided tours (the transport there and back with a bus, admissions, and tour guides are included in the price).

## Prague

Prague, the capital and the largest city in the Czech Republic, the 14<sup>th</sup> largest city in the European Union, and the historical capital of Bohemia is located on the Vltava river. The walking tour will start from Hradčanské square, continuing through all courtyards of Prague Castle with the stunning St. Vitus Cathedral, Old Royal Palace, St. George Basilica, and the Golden Lane on the way. The tour will then visit the Wall Garden and continue down to Nerudova street, the Baroque St. Nicolas Church, the Kampa island, a view of the Petřín hill and its look-out tower, across Charles Bridge to the Old Town with the famous Astronomical Clock, Týn and St. Nicolas Churches, the Estates Theatre, to Wenceslas square, where you will see the National Museum, the Art Nouveau "Evropa" hotel, and a statue of the patron of Bohemia, St. Wenceslas.

## The Moravian Karst and Cerna Hora Brewery

Unlike tours of cities, this trip will take you to a wonderful area in the beautiful surroundings of Brno. The Moravian Karst contains more than 1100 caves out of which 5 are open to the public. We will visit the most attractive one combining a walk through the richly decorated caves, the bottom of the 148,5 m deep Macoča Abyss and a boat ride on the subterranean Punkva river. After lunch in a very nice and new brewery restaurant we will continue with a tour of one of the oldest breweries in the Czech Republic the history of which goes back to the 13th century and is connected with the mysterious order of Knight Templars. You will have an opportunity to learn more about this most popular beverage in the Czech Republic the consumption of which per capita is the highest in the world. Do not forget to take something warm to wear as the constant temperature in the caves is 8°C and in the lager cellar only 2°C.



## Brno City Rally

An event organised by the ESN VUT, a student organisation, which will introduce you to the city in a fun way. The walking tour lasts about four hours and you will take you to the tower of the St. Peter and Paul Cathedral, the Old Town Hall, and the Brno Ossuary.

## FIT campus tour

A guided tour of the Faculty of Information Technology campus, which consists of modern buildings and historical premises of the former Carthusian monastery.



# BRNO – PRAGUE – MORAVIAN KARST



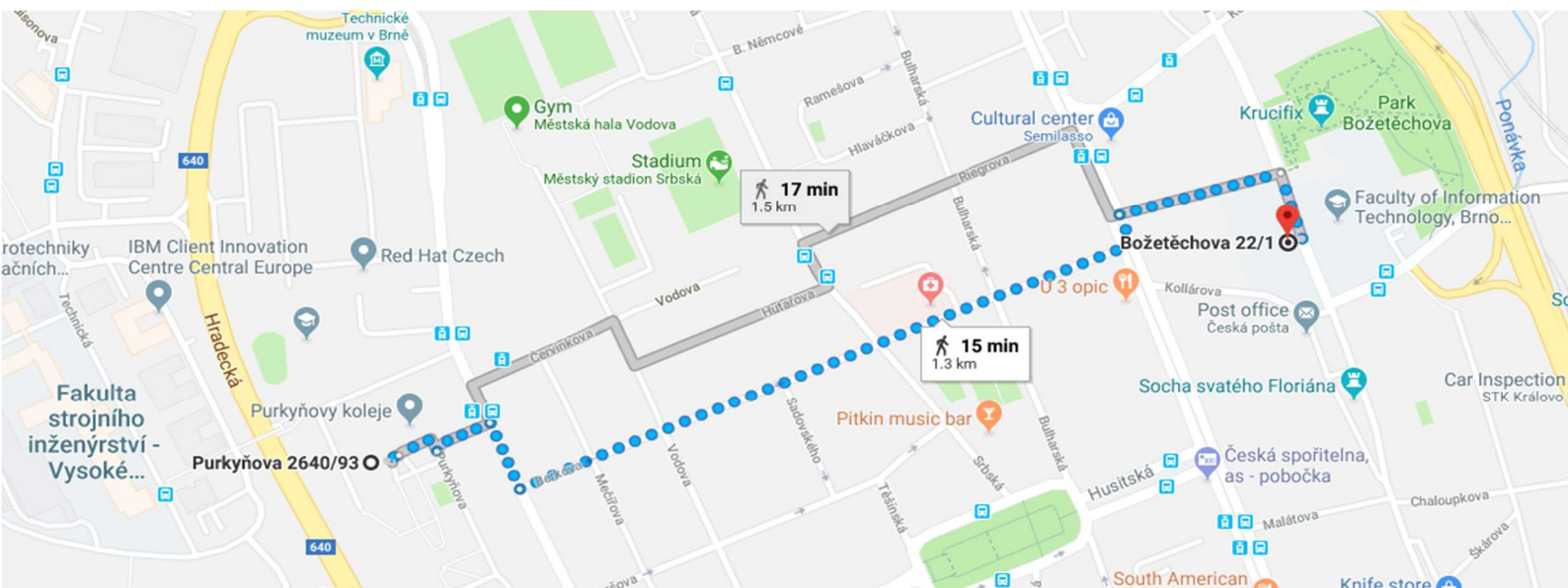
# ACCOMMODATION



Accommodation for BISSIT participants has been booked in the Purkyňova student hostel at Purkyňova street No. 93, Brno, which is in a walking distance to FIT – see the map. Those who would prefer to use Brno's public transport can walk to the Skacelova stop and take buses No. 44, 53, or trolley No. 30 in the direction to Kralovo Pole, see Brno public transportation system.

The accommodation is to be paid in cash in Czech crowns (CZK) on arrival to the facility. The special price for BISSIT students is CZK 250 per night, so e.g. 20 nights (5 to 25 July 2021) is for CZK 5000 (i.e. approx. USD 200).

The living costs in Brno besides the accommodation reach about CZK 500 (USD 25) per day. For more details, see this brochure.



# ACCOMMODATION



# ENROLMENT

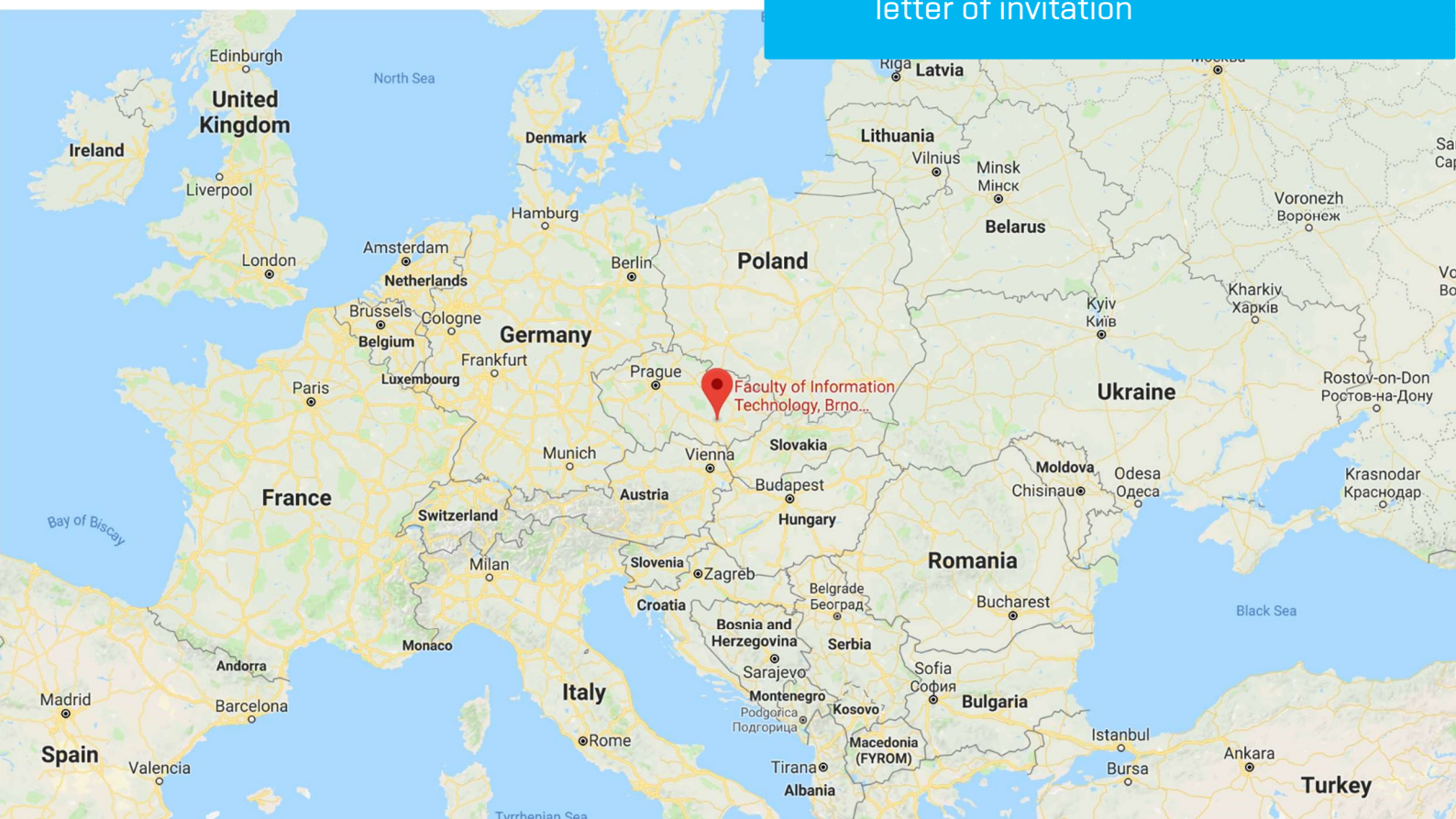
Students interested in the BISSIT programme should apply to the course of their choice using the [Application form](#).

The tuition fee is paid in CZK by a card if possible. Detailed information will be sent to approved candidates.

In case of unexpected cancellation of the summer school for any reason, the tuition fee will be refunded in full by the end of September.

Please send any questions to:  
[bissit@fit.vut.cz](mailto:bissit@fit.vut.cz)

1. **30<sup>th</sup> April 2021**  
the deadline to complete the on-line [Application form](#)
2. **10<sup>th</sup> May 2021**  
the latest candidates receive a notice of admission together with housekeeping (arrival, accommodation, registration etc.) and payment information
3. following a payment  
accepted students receive a letter of invitation



Faculty of Information Technology  
Brno University of Technology  
Bozotechnova 1/2  
612 66 Brno, Czech Republic  
Europe