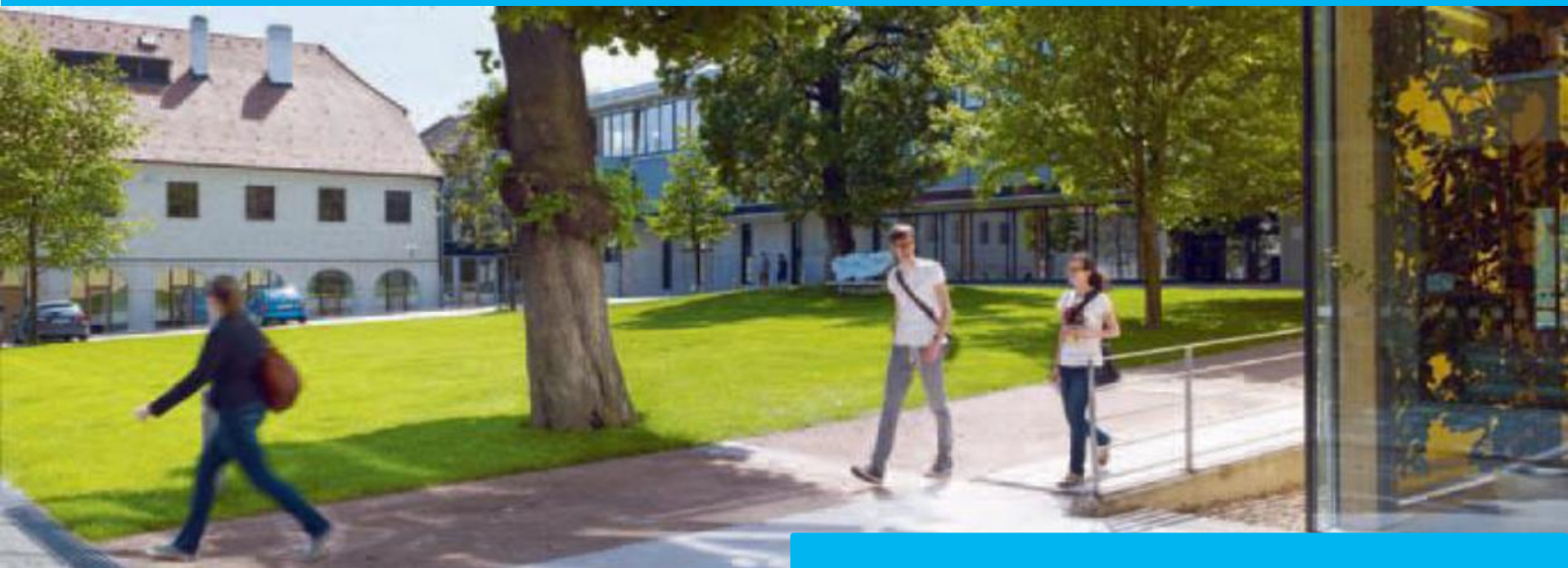


# 2019 Brno International Summer School in Information Technology



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 1560
- **Duration:** 13 academic days
- **Dates:** 15 to 31 July
- **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 200 USD discount on the tuition fee.

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

**prepare for your future in IT**

# PROGRAMME

The 2019 Brno Summer School in Information Technology offers courses in three important areas of information technology:

1. Interactive Applications,
2. Machine Learning, and
3. Robot Programming.

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) 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

## 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.

### Lecturers

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

### 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

## Summary

Students will learn about robotics, from low-level sensors to high-level planning and controlling. They will learn about programming of Arduino and robotic sensors, connecting various components to Arduino, and interfacing Arduino to a higher-level computer. Lectures will also focus on basic robotics algorithms like localisation, map making, and path planning. Attention will also be paid especially to the internationally recognised robotic framework (ROS) for utilizing studied algorithms. The students will also have an opportunity to learn about agents and multiagent systems for highest level planning and decision-making.

## Key outcomes:

- ▮ Learning about sensors used in robotics
- ▮ Connecting components to Arduino and programming I/O operations
- ▮ Interfacing Arduino to a PC with ROS
- ▮ Learning robotics algorithm for path planning, localization, and SLAM
- ▮ Working with ROS
- ▮ Learning about high-level planning and decision making for agents

## Guarantor



**Jaroslav Rozman, Ph.D.**

Jaroslav Rozman is an assistant professor at FIT BUT. His research interests are in robotics, artificial intelligence and computer vision domain, particularly Mobile Robot Navigation. He is teaching courses about Robotics and Fundamentals of Artificial Intelligence. In the European project for autonomous warehouses, he designed a system for autonomous forklifts. He took part in an expert group preparing document about autonomous cars for Czech Ministry of Transport. His big hobby is also genealogy, and he is now leader of genealogical project funded by national Technology Agency of the Czech Republic.

## Lecturers

Jaroslav Rozman, František Zbořil jr., Marek Žák, and Daniel Babušek



# 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 COUNTRY

# 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.

## Vienna

Vienna, the capital and the largest city of Austria, located on the Danube River, is considered to be a city of music, historical monuments, imperial palaces, museums, and shopping. You can admire the gothic St. Stephen's cathedral or the seat of the emperors – the Hofburg Castle. The Albertina Gallery or the Museum Quarter boast extensive collections of classic and modern art. If you are keen on shopping, do not forget to walk down the "Mariahilfer Strasse", which is well known for its numerous shops and boutiques. And you should definitely find a time to try the traditional "Sacher" cake in one of the local cafés. The journey takes about 4 hours, depending on the traffic. The guide will accompany you to the city centre and show you the main tourist points of interest.



## 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.

## FI 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.





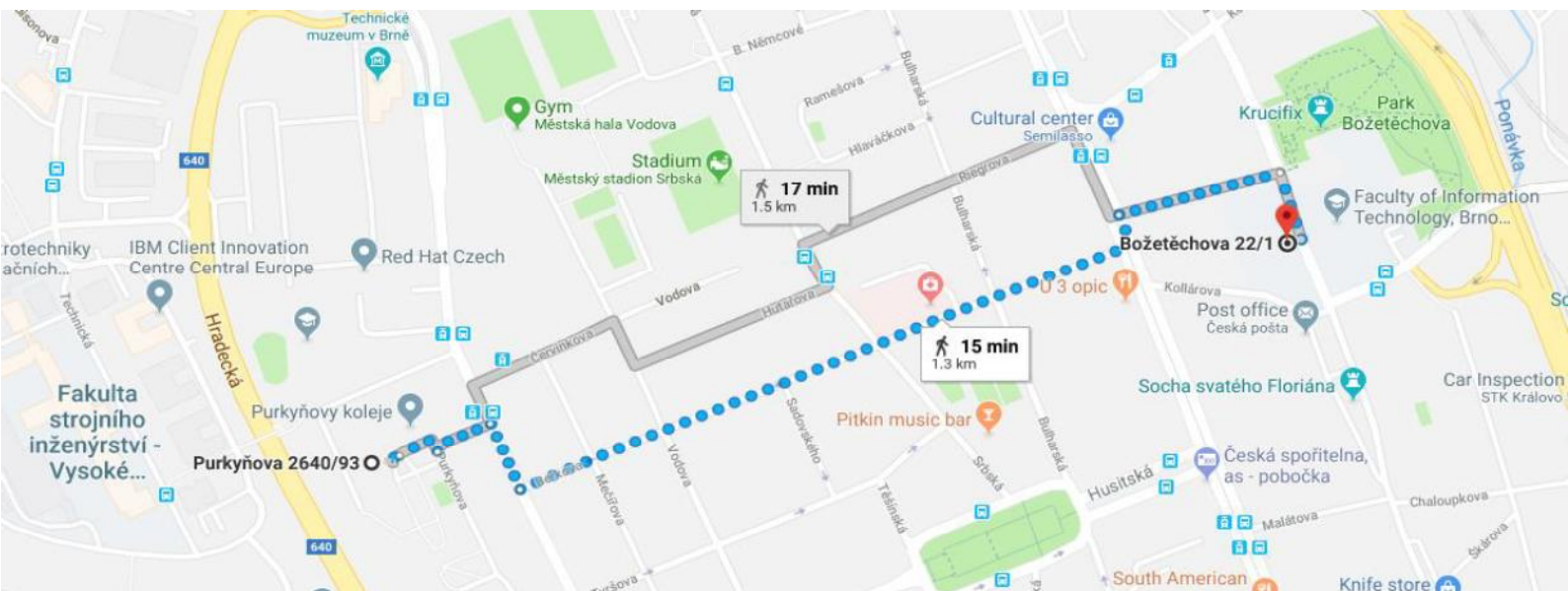
# ACCOMMODATION



Accommodation for BISSIT participants has been booked in the Purkynova student hostel at Purkynova 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 200 per night, so e.g. 18 nights (13 – 31 August 2019) is for CZK 3600 (i.e. approx. USD 160).

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



# ACCOMMODATION



# ENROLMENT

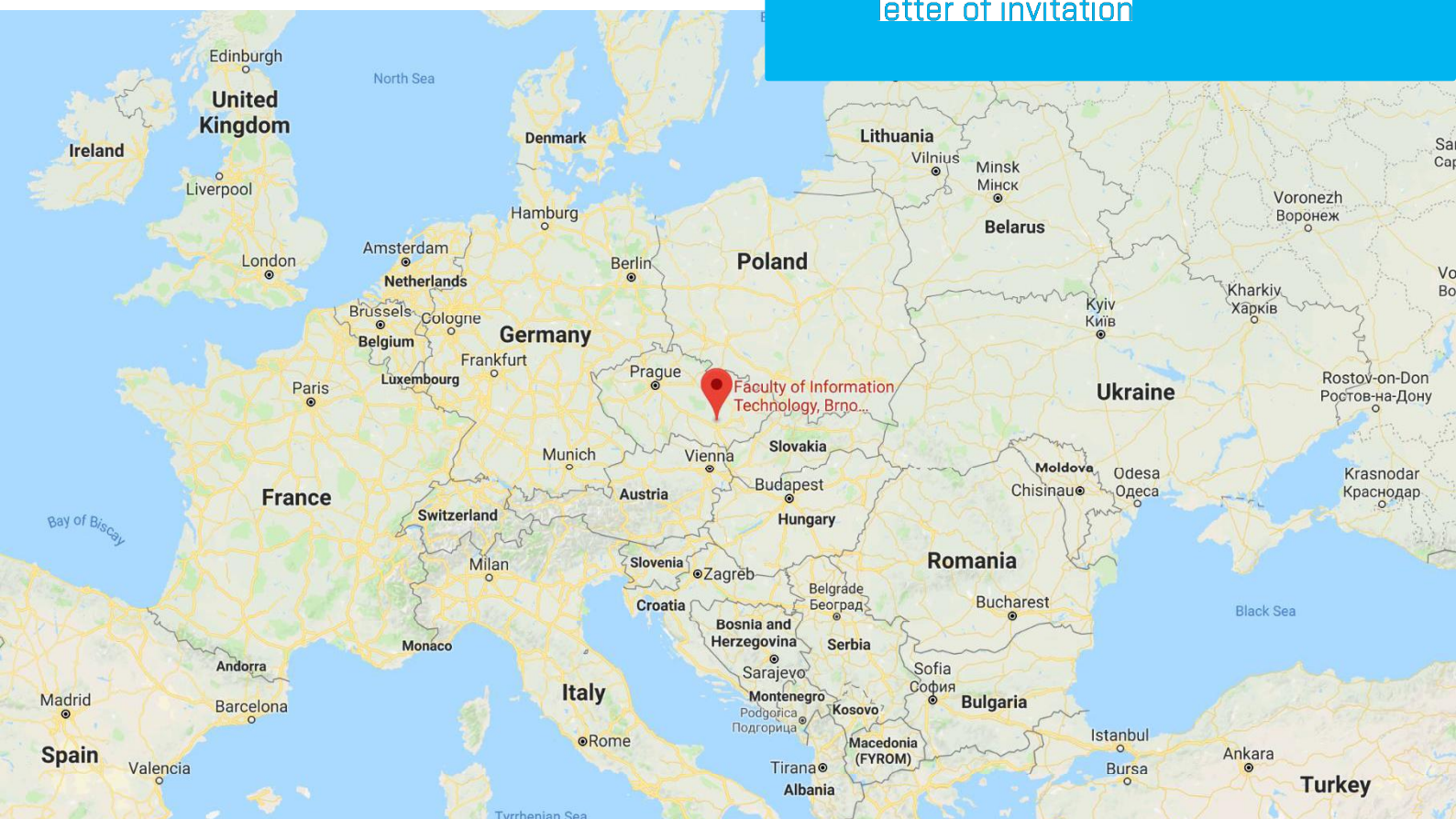
Students interested in the 2019 BISSIT programme should apply to the course of their choice using the [Application form](#).

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 2019.

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

- 1 **15th of April 2019**  
the deadline to complete the on-line [Application form](#)
- 2 **18th of April** 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



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**Brno University of Technology**  
**Božetechova 1/2**  
**602 00 Brno, Czech Republic**  
**Europe**