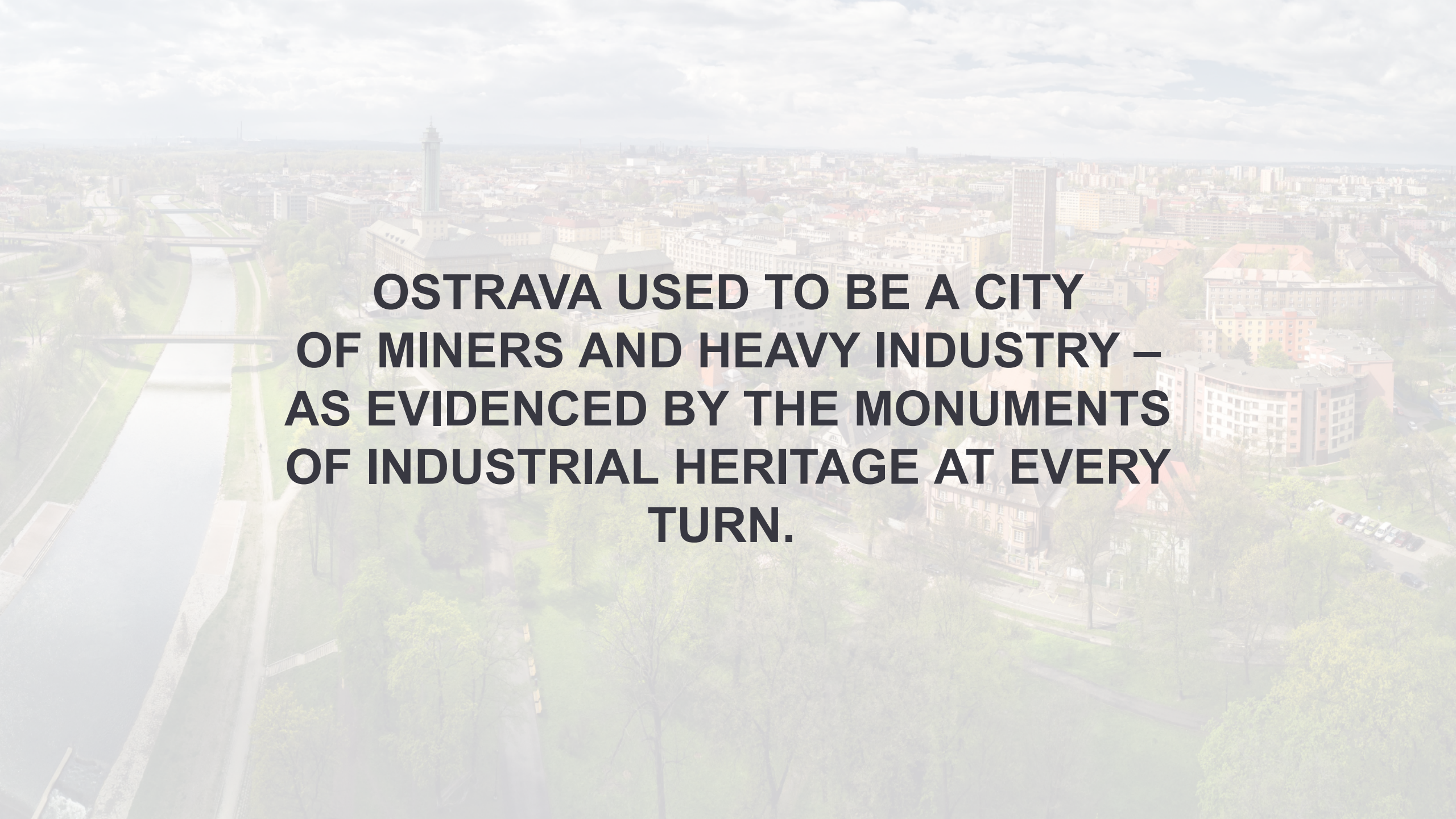
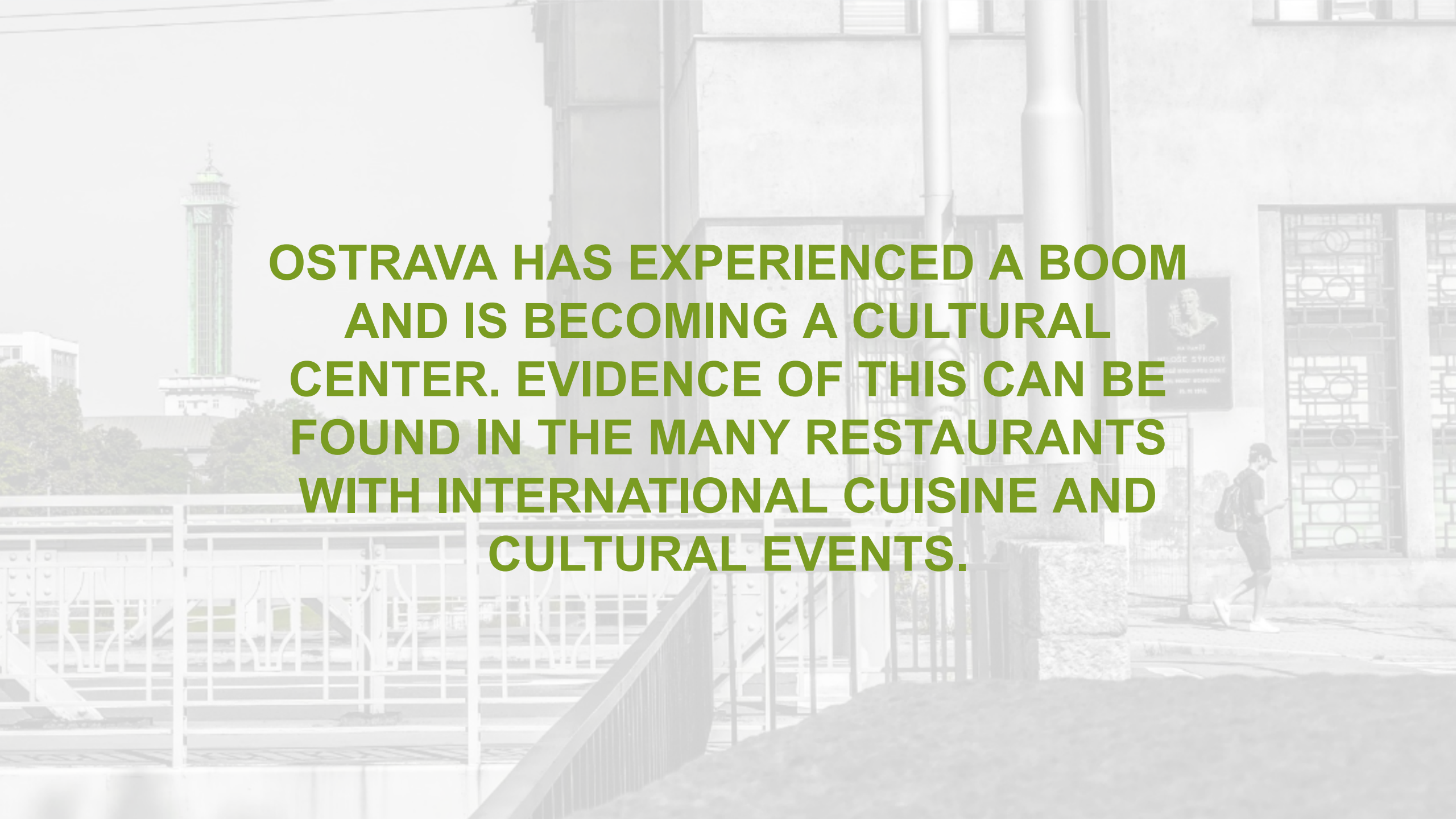

STUDY
IN OSTRAVA
UNIVERSITY OF OSTRAVA
FACULTY OF SCIENCE



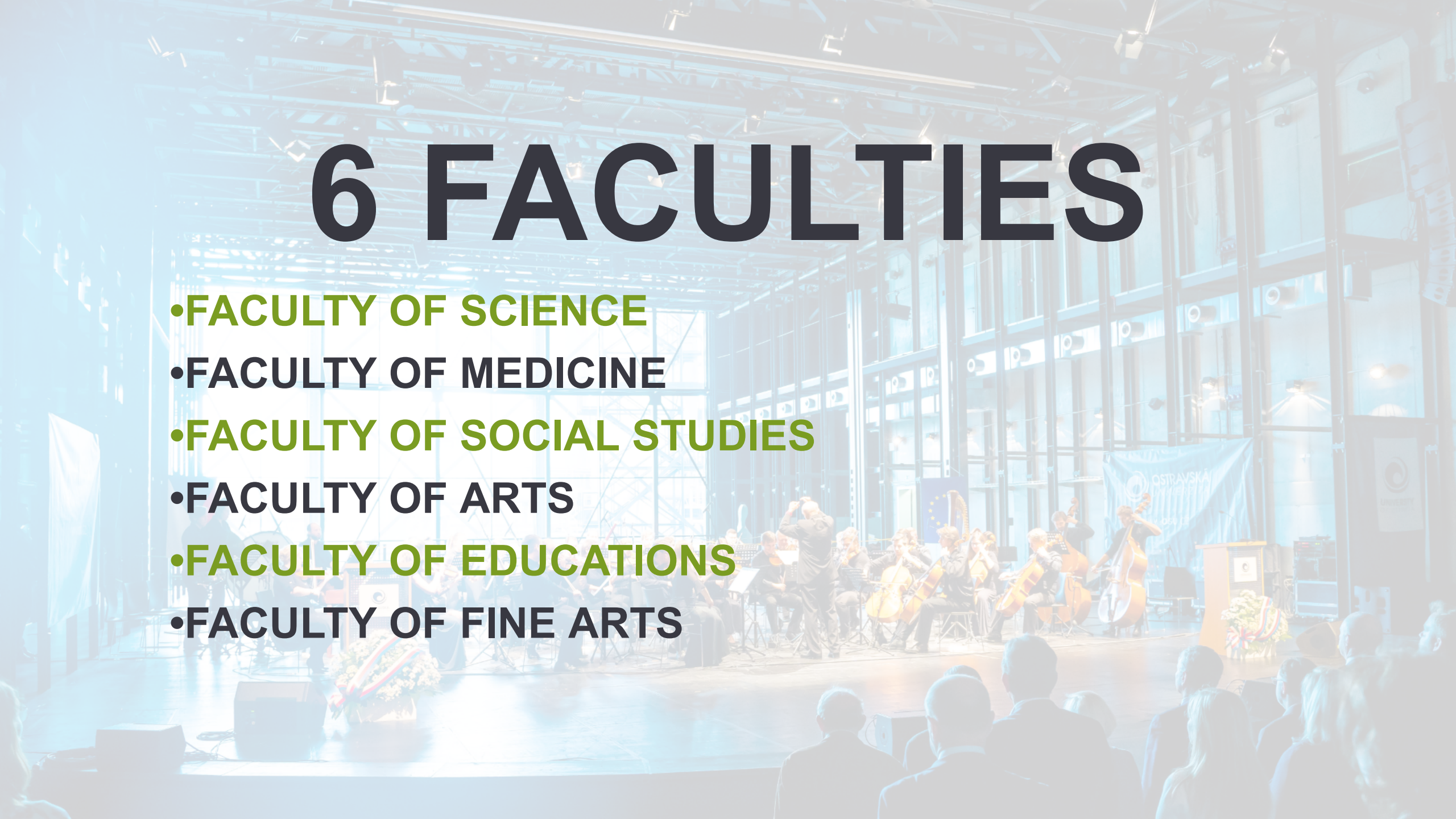
OSTRAVA USED TO BE A CITY OF MINERS AND HEAVY INDUSTRY – AS EVIDENCED BY THE MONUMENTS OF INDUSTRIAL HERITAGE AT EVERY TURN.


NEW
SPIRIT
UNIVERSITY OF OSTRAVA
FACULTY OF SCIENCE



OSTRAVA HAS EXPERIENCED A BOOM AND IS BECOMING A CULTURAL CENTER. EVIDENCE OF THIS CAN BE FOUND IN THE MANY RESTAURANTS WITH INTERNATIONAL CUISINE AND CULTURAL EVENTS.


UNIVERSITY
OF OSTRAVA



6 FACULTIES

- FACULTY OF SCIENCE
- FACULTY OF MEDICINE
- FACULTY OF SOCIAL STUDIES
- FACULTY OF ARTS
- FACULTY OF EDUCATIONS
- FACULTY OF FINE ARTS


UNIVERSITY
OF OSTRAVA
FACULTY OF SCIENCE

7 DEPARTMENTS

- BIOLOGY AND ECOLOGY
- HUMAN GEOGRAPHY AND REGIONAL DEVELOPMENT
- CHEMISTRY
- **INFORMATICS AND COMPUTERS**
- MATHEMATICS
- PHYSICAL GEOGRAPHY AND GEOECOLOGY
- PHYSICS

Department of informatics and computers

- Established in 1991 - initially a few workers
- 90s – BSc. and MSc. Study
- 2004 – accreditation of doctoral studies – in cooperation with the Institute for research and applications of fuzzy modeling
- 2015 – already over 500 students and over 20 staff
- 2020 – approx. 400 students, 17 AP, over 10 doctoral students, Bc.-NMgr.-PhD. study


EDUCATION
UNIVERSITY OF OSTRAVA
FACULTY OF SCIENCE

Main research specializations

- **Soft-Computing** methods in Computer Science (close cooperation with the Institute for Research and Applications of Fuzzy Modeling)
- Fuzzy modeling tools for analysis and design of Information Systems
- Artificial Intelligence methods in recognition and modeling of structures
- Adaptive algorithms of differential evolution
- Modeling of business processes
- Cybersecurity (Cisco)

Main study programmes

Bachelor:

- Informatics
- Applied informatics
- Software systems

Master, Doctoral

full-time, combined, distance

SP AI BSc. – specialization AI

Předměty bloku

Zkratka	Varianta	Název	Kredity	Zakončení	Rozsah hodin	Dop. ročník	Dop. semestr	
KIP/7ALG1	2018	Základy algoritmizace	5	Zk	2+2+0	1	ZS	Z
KIP/7APOS	2018	Architektura počítačů a základy OS	5	Zk	2+2+0	1	ZS	P
KIP/7ZAIN	2018	Základy teoretické informatiky	5	Zk	2+2+0	1	ZS	Z
KMA/7USMA	2018	Úvod do studia matematiky	4	Zp	2+4+0	1	ZS	Z
KIP/7ALG2	2018	Algoritmy a datové struktury	5	Zk	2+2+0	1	LS	Z
KIP/7GRAJ	2018	Gramatiky a jazyky	5	Zk	2+2+0	1	LS	Z
KIP/7MAIN	2018	Diskrétní matematika pro informatiky	4	Zk	1+2+0	1	LS	Z
KIP/7OPSY	2018	Operační systémy	5	Zk	2+2+0	1	LS	P
KIP/7GALP	2018	Principy a algoritmy počítačové grafiky	6	Zk	2+2+0	2	ZS	Z
KIP/7LIN1	2018	Logika pro informatiky	5	Zk	2+2+0	2	ZS	Z
KIP/7OPR1	2018	Objektově orientované programování 1	5	Zk	2+2+0	2	ZS	P
KIP/7UVDT	2018	Úvod do databází	5	Zp	2+2+0	2	ZS	Z
KIP/7ZMSP	2018	Zákl. mat. statistiky a pravděpodobnosti	4	Zk	2+2+0	2	ZS	Z
KMA/7LAG1	2018	Lineární algebra 1	6	Zk	2+2+0	2	ZS	Z
KMA/7MAN1	2018	Matematická analýza 1	8	Zk	2+4+0	2	ZS	Z
KIP/7DBS1	2018	Databázové systémy 1	5	Zk	2+2+0	2	LS	P
KIP/7OPR2	2018	Objektově orientované programování 2	6	Zk	2+2+0	2	LS	P
KIP/7POS1	2018	Počítačové sítě 1	6	Zk	2+2+0	2	LS	P
KIP/7SOFC	2018	Základy softcomputingu	4	Zp	2+2+0	2	LS	Z
KIP/7SWI1	2018	Softwarové inženýrství 1	4	Zk	2+2+0	2	LS	P
KIP/7AGI3	2018	Angličtina v informatice 3	5	Zk	0+2+0	3	ZS	B
KIP/7BPR1	2018	Bakalářský projekt I	4	Zp	0+2+0	3	ZS	P
KIP/7BPR2	2018	Bakalářský projekt II	6	Zp	0+2+0	3	LS	P

Courses for Exchange Students

Course	Faculty	Semester	Credits	Level	Language
Artificial Intelligence	Faculty of Science	Winter	5	Bc.	Czech,English
Computer architecture and the basics of operating systems	Faculty of Science	Winter	5	Bc.	Czech,English
English Conversation on ICT Topics 1	Faculty of Science	Winter	3	Bc.	Czech,English
English in Informatics 3	Faculty of Science	Winter	5	Bc.	Czech,English
Informatics of Smarthouses	Faculty of Science	Winter	3	Bc.	Czech,English
Introduction into Databases	Faculty of Science	Winter	5	Bc.	Czech,English
Logic for informatics	Faculty of Science	Winter	5	Bc.	Czech,English
Neural Networks	Faculty of Science	Winter	5	Bc.	Czech,English
Object-Oriented Programming 1	Faculty of Science	Winter	5	Bc.	Czech,English
Parallel programming and calculations	Faculty of Science	Winter	4	Mgr.	Czech,English
Principles and Algorithms in Computer Graphics	Faculty of Science	Winter	6	Bc.	Czech,English
Programming Server Applications	Faculty of Science	Winter	4	Bc.	Czech,English
Responsive Web Pages	Faculty of Science	Winter	4	Bc.	Czech,English
Techniques for testing and debugging of applications	Faculty of Science	Winter	3	Bc.	Czech,English
Unix Systems	Faculty of Science	Winter	5	Bc.	Czech,English
Web and database applications in PHP	Faculty of Science	Winter	4	Bc.	Czech,English

Courses for Exchange Students

Course	Faculty	Semester	Credits	Level	Language
Analysis of Time Series	Faculty of Science	Summer	6	Mgr.	Czech,English
Basics of Softcomputing	Faculty of Science	Summer	4	Bc.	Czech,English
Business Process Modelling	Faculty of Science	Summer	6	Mgr.	Czech,English
Computer Networks 1	Faculty of Science	Summer	6	Bc.	Czech,English
English Conversation on ICT Topics 2	Faculty of Science	Summer	3	Bc.	Czech,English
Geometric modelling in computer graphics	Faculty of Science	Summer	6	Mgr.	Czech,English
Heuristic algorithms of optimization	Faculty of Science	Summer	6	Mgr.	Czech,English
Object-Oriented Programming 2	Faculty of Science	Summer	6	Bc.	Czech,English
Operating Systems	Faculty of Science	Summer	5	Bc.	Czech,English
Oracle	Faculty of Science	Summer	4	Bc.	Czech,English
Websites and redaction systems	Faculty of Science	Summer	3	Bc.	Czech,English

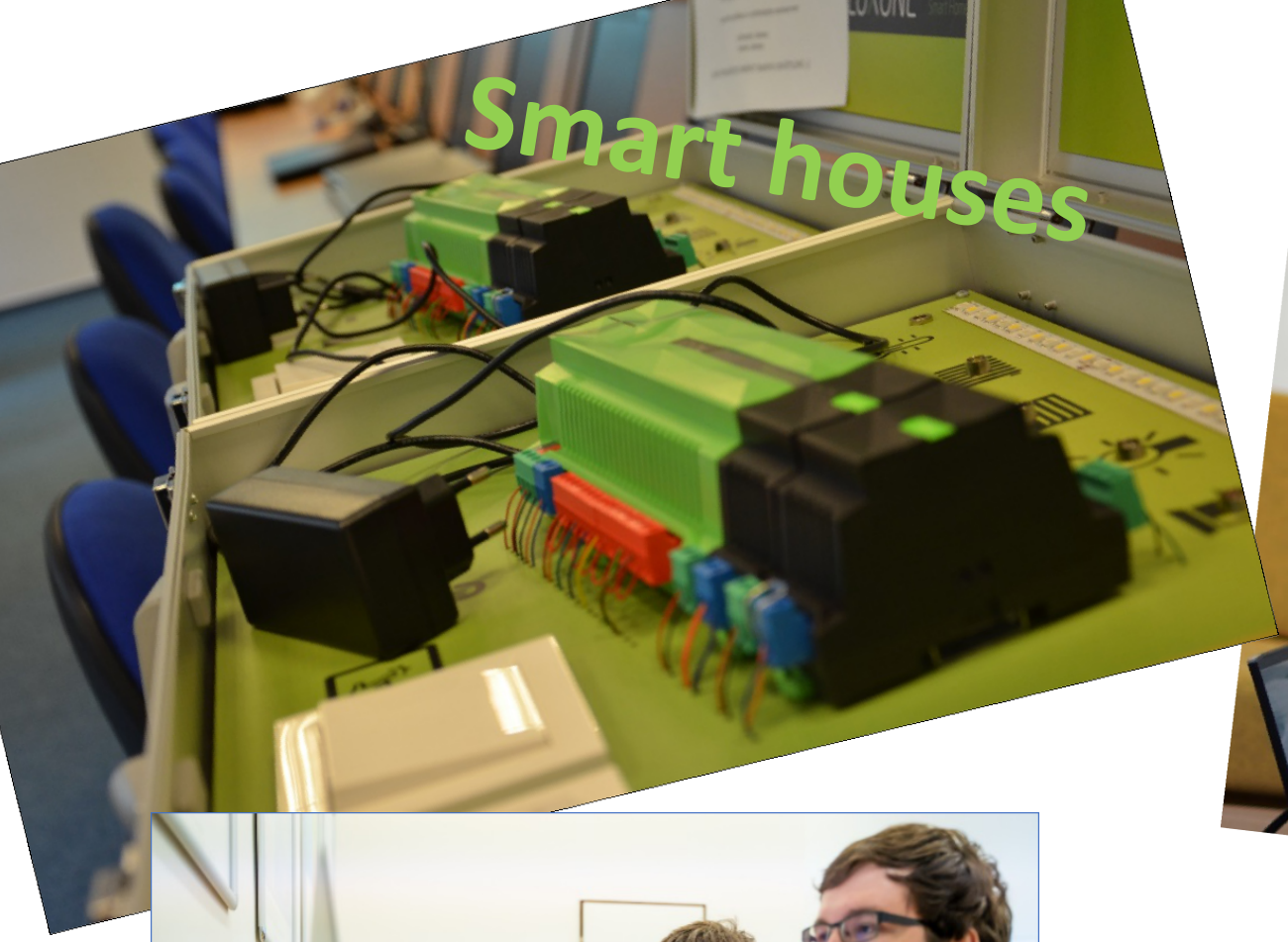
List of Courses at the Department of Informatics and Computers

Laboratories and class on DIC

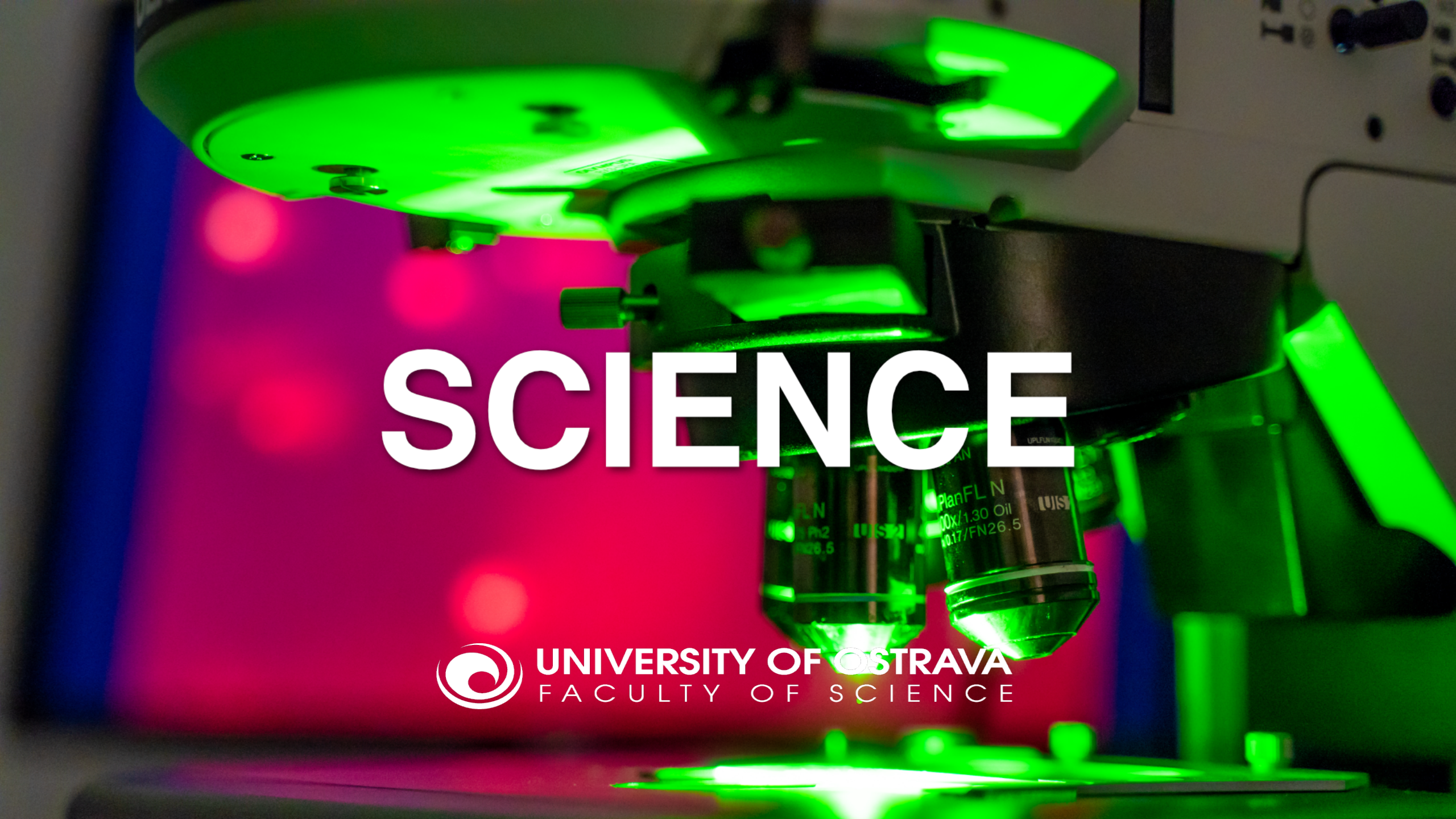
- As part of the OP VVV project, KIP implemented the renovation of laboratories for approximately CZK 12 million
- Specialized language laboratory
- Mobile application development laboratory
- Software Engineering Lab
- Intelligent Systems Laboratory
- Laboratory of computer graphics
- Laboratory of computer networks

- Our entire building A is now under complete renovation

Laboratories



Apple classroom


SCIENCE
UNIVERSITY OF OSTRAVA
FACULTY OF SCIENCE

Research on Department of Informatics and Computers

Main research specializations

- Focused to **Soft-Computing** methods in Computer Science (close cooperation with Institute for research and applications of fuzzy modeling)
- Fuzzy modeling tools for analysis and design of Information Systems
- Artificial Intelligence methods in recognition and modeling of structures
- Adaptive algorithms of differential evolution
- Modeling of business processes

Main research themes

Fuzzy logic and its applications

- Fuzzy control in applications (home automation)
- Time series prediction (fuzzy logic with linguistic variables – transparent prediction with rulebases)
- Pattern recognition on various data types (character recognition on image based Fuzzy Logic Analysis, industrial project)
- Image processing (fuzzy transform for data compression, edge detection, etc.)
- Fuzzy logic knowledge representation and deduction

Main research themes

Biologically inspired computational methods

- Neural networks in typical tasks of Artificial Intelligence (time series prediction, optical character recognition, structure recognition in ECG etc.)
- Evolutionary algorithms (differential evolution method – both theoretical and experimental research)
- Genetic algorithms (genetic optimization, automated design of specific algebras with complex properties)
- Some projects bring comparison of both symbolic and connectionist methods in Artificial Intelligence tasks (cooperation of “logical” and “neural” teams)

Selected application oriented projects

Character recognition on metal ingots

- Project for real firm KMC group s.r.o.
- Although the project was IRAFM based, dept. cooperated in concurrent neural networks based methods (interesting comparison of advantages and disadvantages)
- Fuzzy logic analysis vs. neural networks of various types (FL more successful in this specific problem)
- Real software implementation for industry

Interesting references

- NOVÁK, V., HABIBALLA, H., HURTÍK, P., ŠTĚPNIČKA, M. Recognition of Damaged Letters Based on Mathematical Fuzzy Logic Analysis. *Journal of Applied Logic.* 2015, Elsevier, vol. 13, pp. 94-104.
- Eva Volna, Martin Kotyrba, and Hashim Habiballa, “ECG Prediction Based on Classification via Neural Networks and Linguistic Fuzzy Logic Forecaster,” The Scientific World Journal, vol. 2015, Article ID 205749, 10 pages, 2015. doi:10.1155/2015/205749