www.fri.uni-lj.si/en | doctoral.studies@fri.uni-lj.si | +386 1 479 8123

# Prospective Student Day

## Doctoral Study Programme Computer and Information Science

University *of Ljubljana*
Faculty *of Computer and Information Science*

# Why Become a Doctoral Student at FRI?

# Our Successful Doctoral Students

University of Ljubljana
Faculty of Computer and Information Science


HARVARD UNIVERSITY

**Asst. Prof. dr. Marinka Žitnik, 2015**
Harvard University

Genialis

**dr. Nejc Škoberne, 2013**
CEO & Co-founder of Genialis

**dr. Miha Štajdohar, 2012**
CTO & Co-founder of Genialis

Zemanta™
an outbrain Company

**dr. Martin Jakomin, 2019**
Zemanta

facebook

**dr. Jure Žbontar, 2016**
Facebook


**dr. Tom Vodopivec, 2018**
CEO & Co-founder of Reveris


**dr. Sanja Fidler, 2010**
CEO of NVIDIA AI Reseach

# Modern Facilities

University *of Ljubljana*
Faculty *of Computer and Information Science*

## 12 Computer Classrooms

## 19 Reseach Laboratories

**Access to HPC RIVR –** among Top 100 supercomputers (10 PetaFLOPS, 120.000 cores)

# Research

University of Ljubljana
Faculty of Computer and Information Science

**Systems and networks**

**Machine perception and multimedia**

**Computational biology**

**Software engineering and informatics**

**Machine learning and artificial intelligence**

**Theoretical computer science and mathematical methods**

**19**

Laboratories

fri.uni-lj.si/en/research/laboratories

**60**

Mentors

fri.uni-lj.si/en/mentors

# Doctoral theses

https://repozitorij.uni-lj.si/Statistika.php

University of Ljubljana
Faculty of Computer and Information Science

- Methods of network embeddings and their applications, 2021
- Visual ear detection and recognition in unconstrained environments, 2021
- Automated planning with induced qualitative models in dynamic robotic domains, 2021
- Representing visual entities with deep hierarchical and compositional models, 2021
- Discriminative appearance models for efficient correlation-based visual object tracking, 2021
- Bayesian models for multivariate count data, 2021
- Quality of service-aware co-engineering of cloud applications, 2021
- Approximate multipliers for energy-efficient computing, 2021
- Semi-automatic reconstruction and documentation of software development methods, 2020
- Incremental matrix factorization for simultaneous learning from parallel data streams, 2019
- Scalable matrix factorization for data fusion, 2019
- Learning of text-level discourse parsing, 2019
- Emotion Recognition on Twitter Using Neural Networks, 2019
- Semantics-based automated essay evaluation, 2018
- Prediction of aircraft trajectories for air traffic control using machine learning approaches, 2018
- Compositional hierarchical model for music information retrieval, 2018
- Learning decision rules with evolutionary optimization, 2018
- Proactive risk management in information systems, 2018
- Multi-level monitoring and rule-based reasoning in the adaptation of time-critical cloud applications, 2018
- Low-rank matrix factorization in multiple kernel learning, 2018

# Orange Data Mining

http://orange.biolab.si

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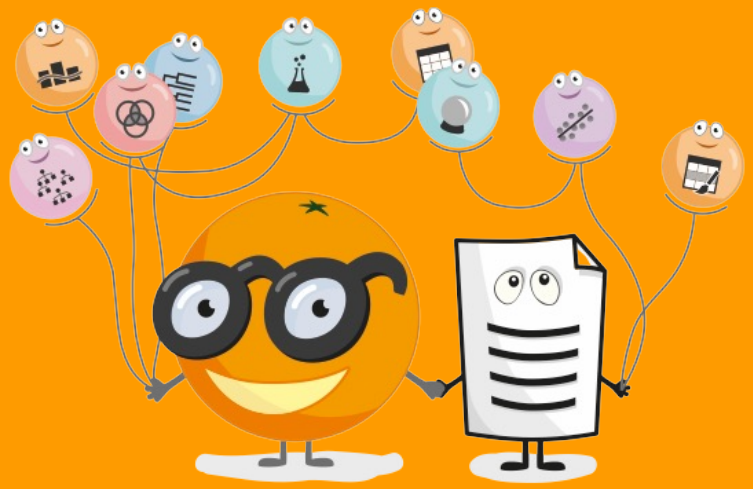
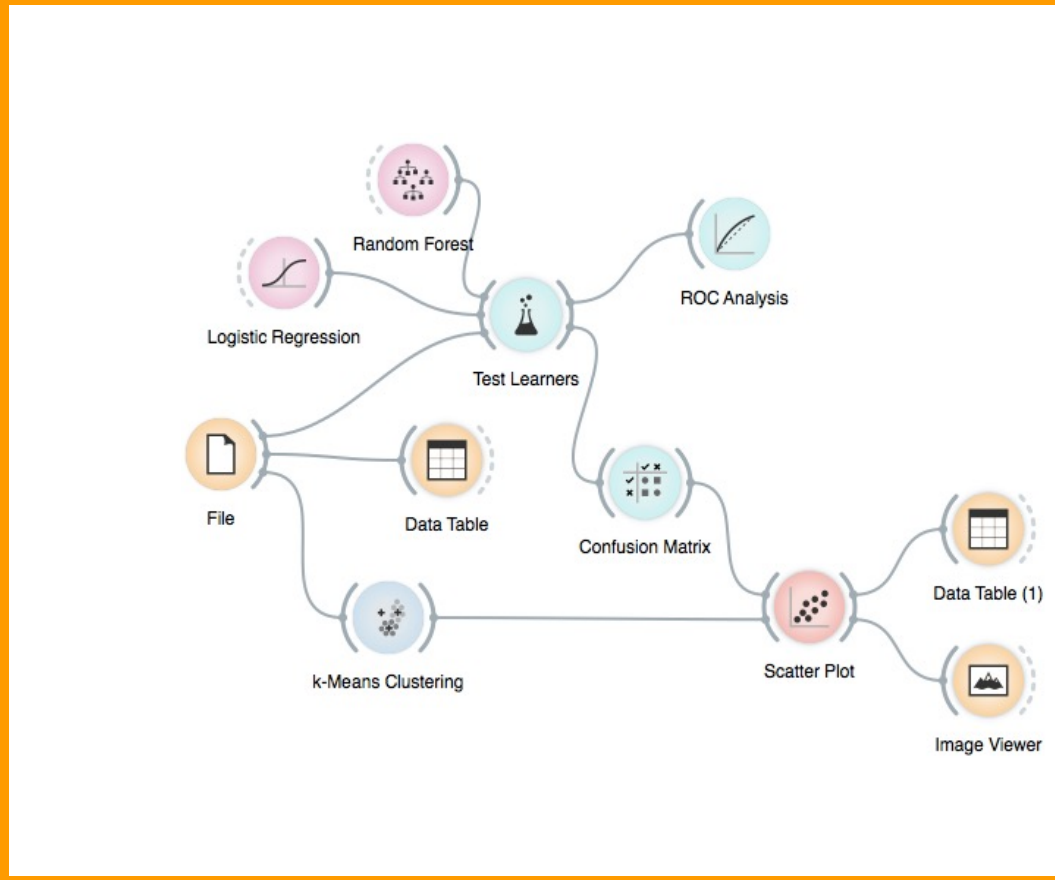
Faculty of Computer and Information Science

- **28,000** monthly downloads
- **24,900** Youtube subscribers
- **2,576,000** views on Youtube



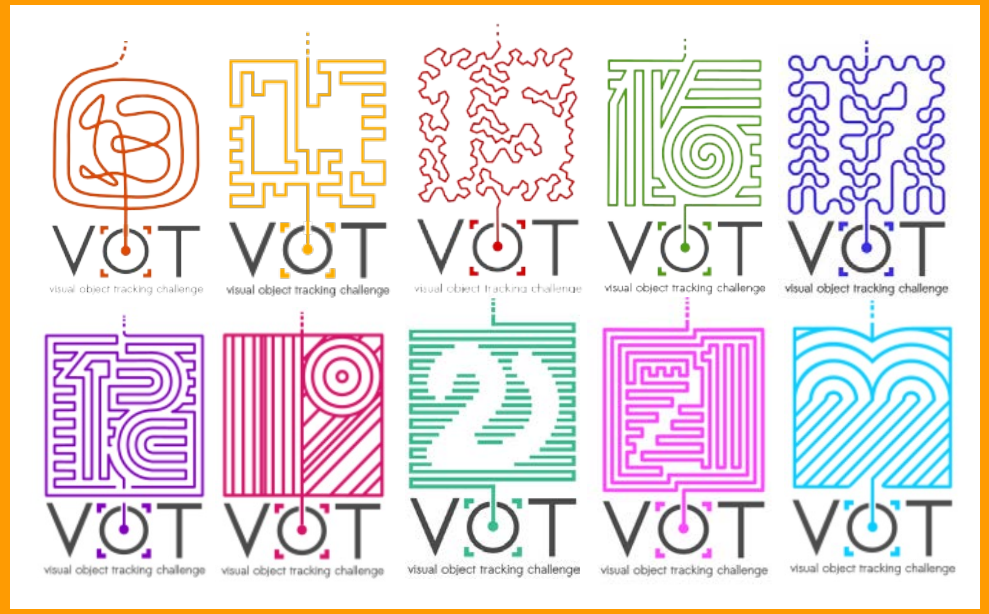


# VOT – Visual Object Tracking initiative

University of Ljubljana
Faculty of Computer and Information Science

http://www.votchallenge.net

- **Running since 2013**
  10th anniversary in 2022
- **VOT2022:** 7 specialized subchallenges
- **Workshop papers with over 100 coauthors**
- **VOT publications cited:** ~3000 (Google Scholar)




ICCV2013 Sidney
ECCV2014 Zürich
ICCV2015 Santiago de Chile
ECCV2016 Amsterdam
ICCV2017 Venice
ECCV2018 Munchen
ICCV2019 Seoul
ECCV2020 Glasgow
ICCV2021 Virtual
ECCV2022 Tel Aviv

# Deep-learning-based Computer Vision

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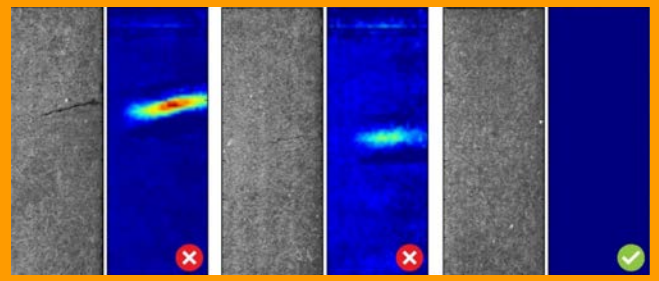
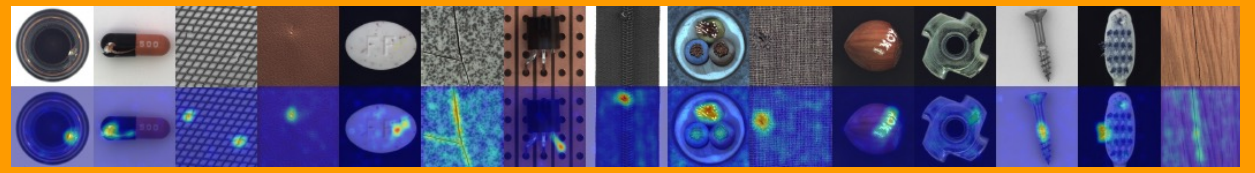
Faculty *of Computer and Information Science*

- Data-driven learning-based machine vision
- Segmentation-based surface anomaly detection
- From supervised to unsupervised learning
- Vision for robotics
- Image enhancement
- Visual tracking
- Biometrics:
  - *Sclera-based Identity Recognition*
  - *Ear Biometrics*
  - *De-Identification*
  - *Soft-Biometric Privacy Enhancement*





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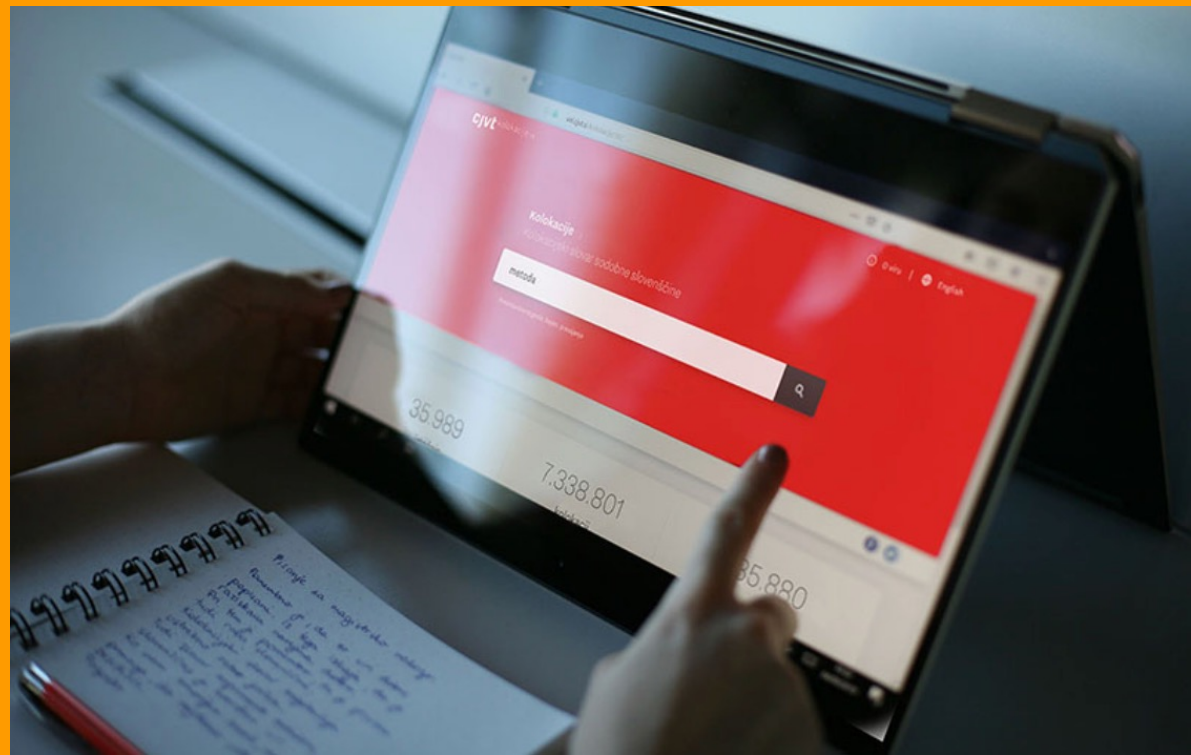
# Development of Slovene in a Digital Environment

## *Language Resources and Technologies*

https://www.cjvt.si/rsdo

- Computational tools and services in the field of language technologies for Slovene
- Natural language Smart assitants
- Open license of software and databases
- Speech recognition
- Speech transcription
- Machine translation
- Terminology extraction
- Terminology portal



University *of Ljubljana*
Faculty *of Computer and Information Science*

# Study Programme

## 1st Year


## 2nd Year


## 3rd Year


## 4th Year

# Elective Courses

University of Ljubljana
Faculty of Computer and Information Science

## 2022/2023

- Machine Learning for Language and Graphs
- Advanced Algorithms for Search and Planning
- INFOSEC of Socio-Technical Systems
- Heterogeneous Computing Platforms
- Computer Graphics and Visualization
- Low-Power Hardware Designs for Next-Generation Signal Processing and Machine Learning Applications

## 2023/2024

- Incremental Learning from Data Streams
- Modern Cryptography and Computer Security
- Advanced Topics in Ubiquitous Sensing and Learning
- Predictive Analytics for Structured Data
- Optimization Methods for Large Networks
- Selected Topics in Analysis of Sound Signals
- Tensor Networks for Machine Learning

# International Collaborations

University of Ljubljana
Faculty of Computer and Information Science

## Collaborations with world-renowned institutions:

- **Joint Research Centre of European Commission (Italy)** – doctoral partnership on cybersecurity and biometrics;
- **The European Organization for Nuclear Research – CERN (Switzerland);**
- **Chinese Academy of Sciences (China)** – joint Chinese-Slovenian virtual laboratory for high performance computing;
- **Kyungpook National University (South Korea)** – joint research in computer vision and wireless computing and a double degree study;
- **University College London (UK)** – joint research in bioinformatics and mobile computing;
- **Baylor College of Medicine (USA)** – joint research in bioinformatics;
- **University of Birmingham (UK)** – joint research in computer vision and robotics;
- **Czech Technical University in Prague (Czech republic)** – joint research in computer vision;
- **Alpe-Adria University Klagenfurt (Austria)** – joint research in computer compilers and algorithmics;
- **University of Belgrade (Serbia)** – joint research in sport statistics and computational linguistics;
- **KAUST – King Abdullah University of Science and Technology (Saudi Arabia)** – computer graphics and visualization technology for depicting the life forms from atoms to organisms

*Internal fund for research and study visits abroad!*

202

**Total number of collaborating institutions**


Open to
Foreign Students

University of Ljubljana
Faculty of Computer and Information Science

## About Slovenia

Slovenia is one of the greenest European countries. Mediterranean Coast, snowy mountain tops of Julian Alps or thermal spa resorts in the Eastern part, famous for its wines, are all just an hour's drive from Ljubljana, the lively and picturesque capital of Slovenia.

# Study in Ljubljana, discover Slovenia

## Student Life in Ljubljana

- Peaceful and safe city
- Low living costs:
  - 400–500€/month
  - Subsidized lunch, transportation
  - Dorms for exchange students
- Tech events for students

# How to Apply for the Doctoral Programme?

University of Ljubljana
Faculty of Computer and Information Science

## Apply Online

**Apply at eVŠ Portal**
http://portal.evs.gov.si/prijava

Master or pre-bologna equivalent study programme

## Application Deadline

**1 June 2022**

Enrolment in September 2022

## Application Enclosures

- a well-structured CV
- a certified copy of your bachelor or master's degree
- a GPA certificate of exams and tutorials
- a motivation letter
- 2 recommendation letters
- mentors's acceptance statement
- short conceptual design of the research work

## Tuition Fees

4200 € for 1st and 2nd year

3000 € for 3rd and 4th year

## Contact

**Mrs. Zdenka Velikonja**

E: zdenka.velikonja@fri.uni-lj.si
T: +386 1 479 8123

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# Assistance to International Students by International Office

## Assistance in applying for:

- study programme online via eVŠ platform
- visa, residence permit
- JRC call

## Advising on:

- documentation for recognition of education
- finding an apartment in Ljubljana
- basic information about living in Slovenia

## Contact Information

**Ms. Vesna Gračner**
E: international.office@fri.uni-lj.si
T: +386 1 479 8249

# Open Positions and Scholarships

University of Ljubljana
Faculty of Computer and Information Science

https://fri.uni-lj.si/en/career-faculty

- **Researcher**
  **Computational approaches for the analysis of rhythmic datasets and their application to biological, environmental and traffic data**
  Contact: *miha.moskon@fri.uni-lj.si*
- **Teaching assistant**
  **Computational approaches for the reconstruction and analysis of context-specific models for systems medicine and systems biology applications**
  Contact: *miha.moskon@fri.uni-lj.si*
- **Researcher**
  **Data-driven learning-based machine vision**
  Contact: *danijel.skocaj@fri.uni-lj.si*
- **Researcher/Teaching assistant**
  **High-Performance Computing, Parallel programming, CPU Architecture, Hardware-software co-design**
  Contact: *branko.ster@fri.uni-lj.si*
- **Teaching assistant**
  **Cloud-native architecture development**
  Contact: *matjaz.juric@fri.uni-lj.si*
- **Researcher**
  **Computer Graphics and/or Visualization empowered by machine learning**
  Contact: *ciril.bohak@fri.uni-lj.si*

# KAUST

University of Ljubljana
Faculty of Computer and Information Science

جامعة الملك عبدالله للعلوم والتقنية
King Abdullah University of Science and Technology

VCC VISUAL COMPUTING CENTER

## Computer graphics and visualization

*Biological processes and data on micro/nano level*

Asst. prof. dr. Ciril Bohak – ciril.bohak@fri.uni-lj.si

- Reconstruction of electron microscopy data:
  e.g. cryo-ET.
- Segmentation and analysis of microscopy data:
  e.g. structure, background segmentation.
- (Procedural) Modeling of biological systems on a molecular level:
  e.g. viruses, bacteria, cell organelles.
- Simulating parts of electron microscope using
  deep learning models: e.g. Simulating noise, electron beam, sensors.
- Deep learning methods in computer graphics:
  e.g. end-to-end differentiable rendering of volumetric data.

https://cemse.kaust.edu.sa/vcc

# Testimonials of Doctoral Students

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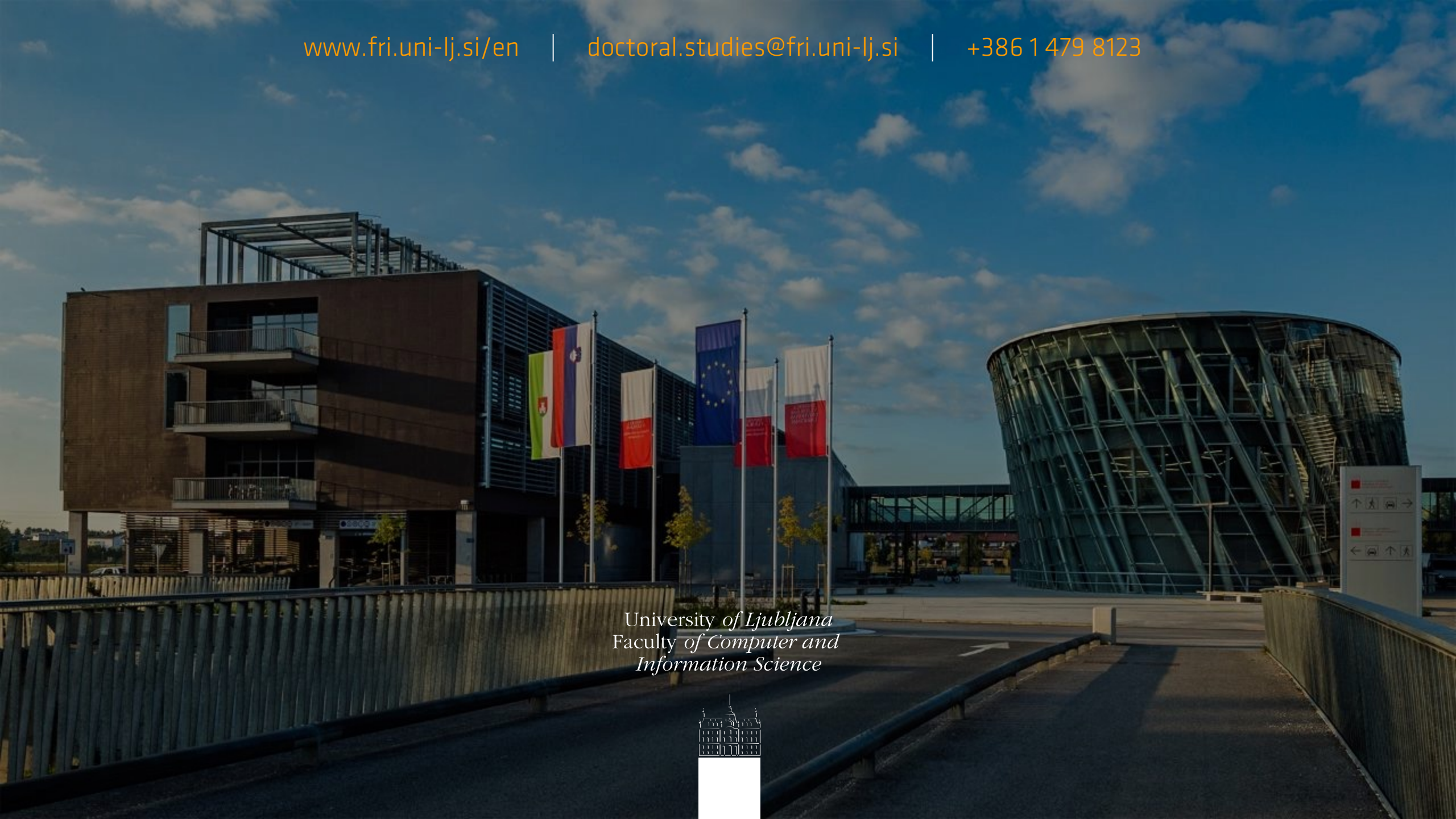

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Questions
& Answers