New Master Specialization in ”Knowledge Engineering”

Dr. Pavel Kordík, Ph.D.

Department of Computer Science
Faculty of Information Technology
Czech Technical University in Prague

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http://www.fit.cvut.cz/en
Overview

Business intelligence job market

Education of BI specialists

About our University and Faculty
- Czech Technical University in Prague
- Faculty of Information Technology

New Knowledge Engineering master specialization
- KE master @ FIT CTU
- Prerequisites
- Core modules
- Optional and supplementary modules

Industrial partners in education

Related research and open source projects

Conclusion
Business intelligence job market

IT Jobs That Need Filling

No. 4
Data/database management
11%

An increasingly complicated job is hard to fill.
Education of BI specialists

- Private companies
  - Specialized BI software intensive training or summer school
  - On-the-job BI training

- Universities
  - Fragmented BI related modules
  - Seldom comprehensive BI program
Czech Technical University in Prague

About the University

CTU has altogether 25 thousand students and over 1,500 academic staff. It offers 80 academic programmes and 315 branches of study within the scope of these programmes.

- Faculty of Civil Engineering
- Faculty of Mechanical Engineering
- Faculty of Electrical Engineering
- Faculty of Nuclear Sciences and Physical Engineering
- Faculty of Architecture
- Faculty of Transportation Sciences
- Faculty of Biomedical Engineering
- Faculty of Information Technology
Faculty of Information Technology

About the Faculty

CTU’s youngest faculty, first students in 2009. Currently over 1200 students in bachelor, master and doctoral programmes. Master program Informatics opened this year.

Expanding to over 3000 students in 2 years ...
Knowledge engineering master specialization

Due to the strong demand from industry, we are opening new master specialization on Knowledge Engineering. A successful graduate of our specialization will predominate with **strong programming background** and **deep theoretical insight** when compared to graduates enrolling related specializations abroad.

**Keywords**

- Data Mining, Analysis, Integration, Preparation, Reporting, Visualization
- Pattern Recognition, Statistics and Probability
- Computational Intelligence Methods, Neural Networks, Evolutionary Algorithms, Swarms, Nature Inspired Methods
- Knowledge Discovery from Databases, Deployment, Business Intelligence
- Functional and Logical Programming, Lisp, Prolog
- Information Systems, Database Systems

Our students can be both theoretically and practically oriented and continue in our doctoral programme with the same specialization or become industrial experts in the field.
Prerequisites and related bachelor program modules

Enroling students should be familiar with the *basic statistic* which is obligatory for majority of bachelor programmes worldwide. We prefer students with excellent *algoritmization* skills and programming background in Java or C++. Basic knowledge of *databases* is also important.

Our bachelor program offers the following modules:

- Database Systems
- Introduction to Probability and Statistics
- Searching Web and Multimedia Databases
- Information Systems Design
- Data Mining
Core modules

KE core modules

- Data Preprocessing
- Pattern Recognition
- Computational Intelligence Methods
- Knowledge discovery from databases
- Functional and Logical Programming
- Advanced Information Systems
- Advanced Database Systems
- Statistics for Informatics

And several individual project modules ...
### Optional and supplementary modules

<table>
<thead>
<tr>
<th>Related modules in the Informatics master program @ FIT CTU</th>
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<tbody>
<tr>
<td>- Web Data Mining</td>
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<td>- Retrieval of Multimedia Content on the Web</td>
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<td>- Web 2.0</td>
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<td>- Semantic Web</td>
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<td>- Integration in Information Systems</td>
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<td>- Management of Business Informatics</td>
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<td>- User Interface Design</td>
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<td>- Advanced Algorithms</td>
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<td>- Modern Internet Technologies</td>
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<td>- Web Services and Middleware</td>
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<td>- Modelling of Business Processes</td>
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<td>- Security and Secure Programming</td>
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Involvement of industrial partners in education

We plan to use commercial business intelligence software in application oriented modules and open source software in theory oriented modules. In application oriented modules, part of lectures will be given by top industrial experts, who will formulate topics and supervise part of student theses.

Example

- Data mining exercises to be prepared in SAS commercial software.
- SPSS and SAS industrial experts have invited lectures in Data preprocessing and KDD modules.
Students involvement in research and open source projects

Selected research projects
- Automated knowledge extraction
- Metalearning and metaoptimization
- Data preprocessing for data mining
- New ensemble methods

Selected open source projects
- FAKE GAME
- JCOOL
- JCOP
The flexibility of the public education is increasingly important as job markets change rapidly. Our faculty offers new specializations designed for future informatics positions.