

# Jakub Kuzilek

## Curriculum vitae

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### Research interests

learning analytics & educational data mining; educational technology; machine learning & artificial intelligence; explainable AI (in education); learning analytics systems implementation

### Education

- 2009–2013 **PhD Artificial Intelligence and Biocybernetics**, *Faculty of Electrical Engineering, Czech Technical University in Prague*, Prague, Czech Republic, with honors
- 2007–2009 **MSc Biomedical Engineering**, *Faculty of Electrical Engineering, Czech Technical University in Prague*, Prague, Czech Republic, with honors, two dean awards for excellent master thesis and study results
- 2004–2007 **BSc Cybernetics and measurement**, *Faculty of Electrical Engineering, Czech Technical University in Prague*, Prague, Czech Republic

### Research Experience

- 2020–present **Humboldt-Universität zu Berlin**, *Computer Science Education/Computer Science and Society research group*, Berlin, Germany  
*Senior Researcher* **2020 - Present**  
Projects LA-DIVA (Researcher) & IMPACT (Researcher & Interim HU team lead)  
Higher education; Learning Analytics; Group Formation; Collaborative Learning; Early Warning Systems; Process mining; Formative Assessments; Adaptive & Automatic Feedback; Explainable AI
- 2023–present **German Research Center for Artificial Intelligence**, *Educational Technology Lab*, Berlin, Germany  
*Principal Researcher* **2023 - Present**  
Project KIperWeb (Co-Principal Investigator)  
Vocational education; Recommendation systems; Knowledge Tracing; Open Source development

- 2017–present **Czech Academy of Sciences, Centre of Administration and Operations**, Prague, Czech Republic  
*IT Consultant for Technology Transfer Office* **2017 - 2019**  
 Project Academic TTO (IT Lead)  
 Technology Transfer; Information Systems; Databases; Software Development  
*IT Consultant for Department of web administration* **2019 - Present**  
 Internal Projects of Czech Academy of Sciences (Lead & Senior Developer)  
 Information systems; Web Development; Databases; IT architecture; System administration; Consultation services
- 2020 **German Research Center for Artificial Intelligence, Educational Technology Lab**, Berlin, Germany  
*Senior Visiting Researcher* **2020**  
 Project tech4comp (Researcher)  
 Discussion forum analysis; Natural Language Processing; Sentiment Analysis; Text processing
- 2015–2020 **Czech Technical University in Prague, Czech Institute of Informatics, Robotics and Cybernetics**, Prague, Czech Republic  
*Research Associate* **2015 - 2017**  
 Knowledge Systems; Educational Data Mining; Machine Learning; Databases  
*Researcher* **2017 - 2020**  
 Project StudentAnalyse (Principal Investigator)  
 Learning Analytics; Educational Data Mining; Machine Learning; Predictive modeling; Databases; ETL processes; Educational Research
- 2013–2017 **The Open University, Knowledge Media Institute**, Milton Keynes, United Kingdom  
*Research Assistant* **2013 - 2014**  
 Project OU Analyse (Data Scientist)  
 Learning Analytics; Educational Data Mining; Predictive modeling; Databases; ETL processes; Large scale implementation  
*Research Associate* **2014 - 2017**  
 Project OU Analyse (Data Scientist - AI)  
 Learning Analytics; Educational Data Mining; Predictive modeling; Databases; ETL processes; Large scale implementation
- 2008–2010 **Medical Technologies CZ a. s., Diagnostics department**, Prague, Czech Republic  
*R&D Engineer* **2008 - 2010**  
 Signal Processing; ECG signal analysis; Software development; Signal analysis; Machine Learning
- 2007–2015 **Czech Technical University in Prague, Department of Cybernetics, Faculty of Electrical Engineering**, Prague, Czech Republic  
*Support scientific staff (student assistant)* **2007 - 2008**  
 Signal processing; Signal Analysis; ECG; Beat detection; Software development  
*Research Assistant* **2010 - 2015**  
 Several projects on biomedical signal processing and education (Principal investigator & Researcher)  
 Signal Processing; Biomedical signals; Machine learning; Signal Analysis; Multimedia development; Software development

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## Achievements, Honors and Awards

**Josef Hlavka Award for outstanding students** *Nadani Josefa, Marie a Zdenky Hlavkovych* Foundation, 2009, <http://www.hlavkovanadace.cz>

**Second place in Physionet Challenge 2011:** Improving the quality of ECGs collected using mobile phones (Event 3), *Computing in Cardiology Conference*, 2011, <https://tinyurl.com/physio-2011>

**Best student paper award for paper** "An Automatic Method for Holter ECG Denoising using ICA" at the Fourth International Symposium on Applied Sciences in Biomedical and Communication Technologies, 2011

**The Best Publicly Available Educational Data Set Prize.** *International Educational Data Mining Society*, 2023, <https://educationaldatamining.org/data-set-awards/>

**Project OU Analyse.** *Knowledge Media Institute, Open University*, received multiple prestigious awards, <https://analyse.kmi.open.ac.uk>, recognized by British Parliament Higher Education Commission

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## Invited Talks

**Bernstein PhD Symposium** (29-30th September 2023, Berlin, Germany): *AI-Driven Higher Education: Building the Future Together*, <https://bernstein-network.de/bernstein-conference/early-career-scientists/phd-symposium/>

**Life@Lab – Horizons of AI Research in Higher Education** (24-25th January 2024, Dresden, Germany): *Project IMPACT - Journey through Implementation of Trusted Learning Analytics AI-based assessment feedback in Higher Education*, <https://tinyurl.com/lifelab-horizons>

**Wissenschaftliche Fachtagung „Learning by testing: Assessment im Fokus“** (18th May 2024, Wiesbaden, Germany): *AI-driven criteria-based assessment feedback*, <https://tinyurl.com/learning-by-testing>

**EDM 2024: the 17th International Conference on Educational Data Mining** (14 - 17th July 2024, Atlanta, USA): *From Vision to Value: Eight years of the Open University Learning Analytics Dataset*, <https://educationaldatamining.org/edm2024/speakers/>

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## Grants

2023–present **Implementierung von KI-basiertem Feedback und Assessment mit Trusted Learning Analytics in Hochschulen (IMPACT)**, *Researcher/Interim Team Lead*, Bundesministerium für Bildung und Forschung, 966k EUR (Humboldt-Universität zu Berlin only)  
<https://impact.studiumdigitale.uni-frankfurt.de/>

2023–2024 **KI-gestützte Personalisierung in der berufsbezogenen Weiterbildung (KIPerWeb)**, *Co-Principal Investigator*, Bundesministerium für Bildung und Forschung, 805k EUR (German Research Center for Artificial Intelligence only)  
<https://tinyurl.com/kiperweb>

2020–2023 **Learning Analytics für Diversity-Inspired Adaptive Learning (LA-DIVA)**, *Researcher*, CATALPA research cluster  
<https://tinyurl.com/catalpa-la-diva>

2019 **Predictive modeling in Learning Analytics**, *Mentor & Principal Investigator*, CTU Student Grant Competition, No. SGS19/209/OHK3/3T/37  
approx. 6800 EUR

- 2018–2020 **Predictive modeling of student performance using learning resources (StudentAnalyse)**, *Principal Investigator*, Czech Science Foundation, No. GJ18-04150Y  
approx. 170k EUR
- 2018 **ImmaturCare: Application supporting care for ex-preterm children**, *Data Science Lead*, Grant programme of capital city Prague, No. DOT/04/03/007204/2018  
approx. 15k EUR
- 2013–2017 **OU Analyse**, *Data Scientist & Researcher*, The Open University, Internal funding grant  
project is still running with different funding sources
- 2013–2016 **New approaches to collection, evaluation and utilization of biological data II.**, *Student Researcher*, CTU Student Grant Competition, No. SGS13/203/OHK3/3T/13
- 2010–2012 **New approaches to collection, evaluation and utilization of biological data**, *Student Researcher*, CTU Student Grant Competition, No. SGS10/279/OHK3/3T/13
- 2012 **Multimedia support for accessible web education**, *Principal Investigator*, University Development Foundation, No. FRVS 1064/2011  
approx. 4300 EUR
- 2011 **Multimedia support for ECG signal processing education**, *Principal Investigator*, University Development Foundation, No. FRVS 2069/2011  
approx. 4300 EUR

## Teaching

- 2023–present **Machine Learning for Education**, *Humboldt-Universität zu Berlin*, bachelor degree course  
Introduction to Machine Learning; Introduction to Learning Analytics & Educational Data Mining; Theory & Practice; Invited lectures; Multiple assignments on Machine Learning in Education
- 2021–present **Learning Analytics**, *Humboldt-Universität zu Berlin*, bachelor degree course  
Practical course; Semester project; Collaborative assignment; Learning Analytics dashboards; Databases; Software development
- 2009–2013 **Introduction to Biomedical Engineering**, *Department of Cybernetics, Faculty of Electrical Engineering*, Czech Technical University in Prague, bachelor degree course  
Introduction to Biomedical Engineering; Signal Processing; Machine Learning; Biomedical signals; Biomedical devices
- upcoming in WS 2024 **Learning Analytics**, *Humboldt-Universität zu Berlin*, course offered for Berlin University Alliance  
Introduction to Learning Analytics; Semester project; Educational Research; Qualitative methods

## Mentoring

Individual student projects: 2  
Research student projects: 3  
Bachelor students: 8

Master students: 6  
Doctoral students: 6

## Academic Functions

### Reviewer (Journals)

Computers and Education; IEEE Transactions on Learning Technologies; Journal of Educational Data Mining; International Journal of Artificial Intelligence in Education; R Journal; International Journal of Mobile Learning and Organisation; International Journal of Human - Computer Studies; Knowledge-Based Systems; Medical Engineering & Physics; IEEE Transactions on Biomedical Engineering; Physiological Measurement; Computers in Biology and Medicine; Biomedical Signal Processing and Control; Measurement; Sensors; Plos ONE

### Reviewer (Conferences)

The International Conference on Learning Analytics & Knowledge; International Conference on Artificial Intelligence in Education; European Conference on Technology-Enhanced Learning; Fachtagung Bildungstechnologien der GI; International Conference on Computers in Education; Conference of European Association for Research on Learning and Instruction

### Reviewer (Grant agencies)

Technology Agency of the Czech Republic; Erasmus+ programme - Czech National Agency for International Education and Research; Czech Ministry of Education; Swiss National Science Foundation; Slovak Research and Development Agency;

## Certifications

### Data analysis/Machine Learning

Algorithms: Design and Analysis, Part 1 (2012, Coursera); Computing for Data Analysis (2014, Coursera); Data Analysis in R the data.table Way (2015, DataCamp); Machine Learning (2015, Coursera); Python (2016, Codecademy); R Developer (2017, DataCamp); Data Scientist with R (2018, DataCamp); Data Analyst with R (2018, DataCamp)

### Teaching

Teaching in English: Leading Ideas and Strategies (2022, ZEWK TU Berlin); Planning a Seminar or Lecture for an English-Speaking Audience (2022, ZEWK TU Berlin); Questioning Techniques - Creating and Keeping Student Engagement in a Seminar or Lecture (2022, ZEWK TU Berlin)

## Languages

Czech	Native	<i>Mother language</i>
Slovak	Bilingual proficiency	<i>Bilingual language</i>
English	Proficient	<i>Daily practice, all work performed in English</i>
German	Independent user	<i>Common daily communication, Reading expert texts</i>