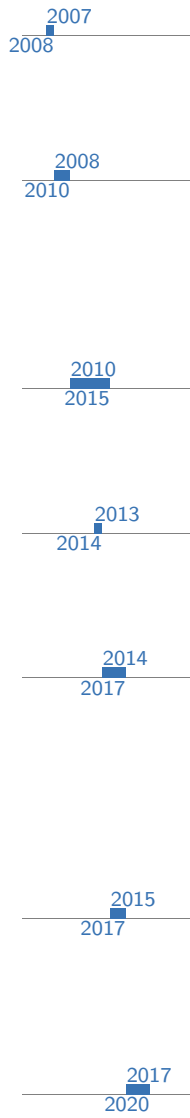


Curriculum vitae

Jakub Kuzilek

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📁 jakubkuzilek.github.io

Experience

- 
- Support scientific staff**, *Department of cybernetics, Faculty of Electrical Engineering, Czech Technical University in Prague*, Prague, Czech Republic.
2007–2008
I was responsible for the development of the MATLAB framework for ECG signal analysis, processing and evaluation.
- Development engineer**, *Diagnostics department, Medical Technologies CZ a. s.*, Prague, Czech Republic.
2008–2010
The team, I was part of, did R&D of ECG diagnostics software for systems ranging from standard 12 lead ECG machines to Holter ECG analysis framework. I was responsible for tuning ECG denoising algorithms and performed ECG collection, classification and data analysis.
- Research Assistant**, *Department of cybernetics, Faculty of Electrical Engineering, Czech Technical University in Prague*, Prague, Czech Republic.
2010–2015
My research covered statistical signal processing and machine learning focusing on ECG and EEG signals.
- Research Assistant**, *Knowledge Media Institute, The Open University*, Milton Keynes, United Kingdom.
2013–2014
I worked on the OU Analyse project, which aims at predicting students at risk of failure of the course. My responsibilities included exploratory data analysis and data cleaning.
- Research Associate**, *Knowledge Media Institute, The Open University*, Milton Keynes, United Kingdom.
2014–2017
After promotion from the assistant on the OU Analyse project, my research focused on the identification of at-risk students, modelling of their behaviour and development of the predictive modelling platform for the delivering weekly predictions of students at risk of failure. The development includes data warehousing, transforming data and using machine learning methods for performing of such predictions.
- Research Associate**, *Czech Institute of Informatics, Robotics and Cybernetics, Czech Technical University in Prague*, Prague, Czech Republic.
2015–2017
I started as a research assistant at Knowledge Systems and Ontologies research group of Czech Institute of Informatics, Robotics and Cybernetics. My research focused on methods and applications of knowledge systems in Educational Data Mining and Learning Analytics.
- Researcher**, *Czech Institute of Informatics, Robotics and Cybernetics, Czech Technical University in Prague*, Prague, Czech Republic.
2017–2020
I led a three-member group of researchers focusing on machine learning methods and their impact on education, and I am the principal investigator of the junior research grant of Czech grant agency, which aims at the exploration of student behaviour in bricks-and-mortar university setting using various data sources available. + PhD student

2020

Senior Visiting Researcher, DFKI, Berlin, Germany.

During my research stay worked on the small sub-project, which was part of the tech4comp project. I aimed to perform the first analysis of student forum data from OPAL LMS used at TU Dresden. The sub-project ended with the developed dashboard performing the sentiment analysis of student messages.

2020

Senior Researcher, Humboldt-Universität zu Berlin, Berlin, Germany.

I am senior postdoc researcher at "Didaktik der Informatik | Informatik und Gesellschaft" research group led by Prof. Niels Pinkwart. I am primarily assigned to the project Learning Analytics für Diversity-Inspired Adaptive Learning, which focuses on diversity aspects of adaptive learning. We focus on three main areas: 1) student self-assessment, 2) collaborative group work, and 3) long-term Learning Analytics. I am highly involved in collaborative group work and long-term Learning Analytics, and the applications of statistical and machine learning methods to data collected by the research partners. I am also advising one PhD student and leading several student projects/thesis.

Education

2004
2007

BSc Cybernetics and measurement, Faculty of Electrical Engineering, Czech Technical University in Prague, Prague, Czech Republic.

2007
2009

MSc Biomedical Engineering, Faculty of Electrical Engineering, Czech Technical University in Prague, Prague, Czech Republic.

with honors

2009
2013

PhD Artificial Intelligence and Biocybernetics, Faculty of Electrical Engineering, Czech Technical University in Prague, Prague, Czech Republic.

Certifications

2012

Algorithms: Design and Analysis, Part 1, Coursera.

2014

Computing for Data Analysis, Coursera.

2015

Data Analysis in R the data.table Way, DataCamp.

2015

Machine Learning, Coursera.

2016

Python, Codecademy.

2017

R Developer, DataCamp.

2018

Data Scientist with R, DataCamp.

2018

Data Analyst with R, DataCamp.

Achievements

- *Josef Hlavka Award* from "Nadani Josefa, Marie a Zdenky Hlavkovych" Foundation
- *Second place in Physionet Challenge 2011*: Improving the quality of ECGs collected using mobile phones (Event 3)
- Best student paper award for paper "An Automatic Method for Holter ECG Denoising using ICA" at the Fourth International Conference on Cognitive Radio and Advanced Spectrum Management (ISABEL 2011), Barcelona, Spain, October 26-29, 2011

- *Project OU Analyse*. It has significant impact on area of Learning Analytics and in higher education in United Kingdom. According to British Parliament Higher Education Commission report: "... predictive analytics can identify which students may not complete their degree on time or even hand in individual assignments, which is already being seen in the UK through the OU Analyse tool. Apart from the OU the Commission does not believe that any UK institution has made significant headway in this area." Report was presented to the British parliament in January 22, 2016. At present, the project has been shortlisted for UNESCO Prize in Education 2020.

Academic Functions

- Reviewer for Computers and Education
- Reviewer for IEEE Transactions on Learning Technologies
- Reviewer for International Journal of Artificial Intelligence in Education
- Reviewer for Medical Engineering & Physics
- Reviewer for IEEE Transactions on Biomedical Engineering
- Reviewer for Physiological Measurement
- Reviewer for Computers in Biology and Medicine
- Reviewer for Biomedical Signal Processing and Control
- Reviewer for Measurement
- Reviewer for Technology Agency of the Czech Republic
- Reviewer for Erasmus+ programme
- Co-organizer of Data Literacy for Learning Analytics workshop at LAK16 conference
- Program committee member of DELFI 2021 Learning Analytics workshop
- Topic editor for Entropy Journal

Research Interests

- Learning Analytics
- Signal processing
- Computer science
- Educational Data Mining
- Machine Learning
- R

Teaching

2009
2013

Introduction to Biomedical Engineering, *bachelor degree course*, FEE, CTU in Prague.

2021

Group semestralproject on Learning Analytics, *master degree course*, Humboldt-Universitaät zu Berlin.

Student supervision

Currently, I am supervising one master thesis and one individual semestral project on topics from the area of Learning Analytics. I am also supervising one student research assistant and assisting with mentoring of one PhD student. In past I supervised five bachelor and two master theses. All of

them successfully finished. I also supervised one PhD student.

Grants

2011	Principal investigator of grant Multimedia support for ECG signal processing education , <i>University Development Foundation</i> , No. FRVS 2069/2011, Finished.
2012	Principal investigator of grant Multimedia support for accessible web education , <i>University Development Foundation</i> , No. FRVS 1064/2011, Finished.
2010 2012	Team member of student grant No. SGS10/279/OHK3/3T/13 , <i>CTU Student Grant Competition</i> , Finished.
2013 2016	Team member of student grant No. SGS13/203/OHK3/3T/13 , <i>CTU Student Grant Competition</i> , Finished.
2018	Team member of grant "ImmatuCare: Application supporting care for ex-preterm children" , <i>Finished</i> .
2018 2020	Principal investigator of grant Predictive modeling of student performance using learning resources , <i>Czech Science Foundation</i> , No. GJ18-04150Y, Finished.
2019 2019	Team member/mentor of student grant No. SGS19/209/OHK3/3T/37 , <i>CTU Student Grant Competition</i> , Finished.
2020	Senior team member of Learning Analytics für Diversity-Inspired Adaptive Learning project , <i>Internally funded by D2L2 research cluster</i> , Running.

Languages

Czech	Native	<i>Mother Tongue</i>
English	Fluent	<i>Daily practice, all work performed in English</i>
German	Advanced beginner	<i>I understand the most day-to-day things</i>

Interests

Books	Sci-fi, Fantasy, Historical
Miniatures	Warhammer 40.000
Sport	Floorball, Trekking
My wife	With my whole life and soul

Journal Publications

2021	Kuzilek, Jakub, Zdenek Zdrahal, and Viktor Fuglik. "Student success prediction using student exam behaviour". In: <i>Future Generation Computer Systems</i> 125, pp. 661–671.
2017	Kuzilek, J. and Hlostá, M., and Zdrahal, Z. "Open University Learning Analytics dataset". In: <i>Scientific Data</i> 4.

2015

Kuzilek, J. and Hlosta, M. and Herrmannova, D. and Zdrahal, Z. and Wolff, A. "OU Analyse: analysing at-risk students at The Open University". In: *LACE: Learning Analytics Review*, pp. 1–16.

2014

Kuzilek, J. and Kremen, V. and Soucek, F., and Lhotska, L. "Independent Component Analysis and Decision Trees for ECG Holter Recording De-Noising". In: *PLoS ONE* 9.6, pp. 1–16.

2014

Macas, M. and Bhonerkar, A.M. and Kumar, R. and Kaur, R. and Kuzilek, J. and Gerla, V. and Lhotska, L., and Kapur, P. "Binary Social Impact Theory based Optimization and Its Applications in Pattern Recognition". English. In: *Neurocomputing* 132, pp. 85–96.

2013

Kuzilek, J. and Lhotska, L. "Electrocardiogram Beat Detection Enhancement Using Independent Component Analysis". English. In: *Medical Engineering & Physics* 35.6, pp. 704–711.

Conference Publications

2021

Paaßen, Benjamin, Andreas Bertsch, Katharina Langer-Fischer, Sylvio Rüdian, Xia Wang, Rupali Sinha, Jakub Kuzilek, Stefan Britsch, and Niels Pinkwart. "Analyzing Student Success and Mistakes in Virtual Microscope Structure Search Tasks". English. In: *Proceedings of the 15th International Conference on Educational Data Mining (EDM 2021)*. (virtual). Ed. by François Bouchet, Jill-Jênn Vie, Sharon Hsiao, and Sherry Sahebi. International Educational Datamining Society.

2021

Schumacher, C. and J. Kuzilek. "Student perspectives on automatic grouping in higher education". In: *Presented at Junges Forum für Medien und Hochschulentwicklung, Virtual Conference, 09-06-2021*.

2021

Schumacher, C., N. Reich-Stiebert, J. Kuzilek, M. Burchart, J. Raimann, J.-B. Voltmer, and S. Stürmer. "Group perceptions vs. group reality: Exploring the fit of self-report and log file data in the process of collaboration." In: *Companion proceedings of Conference on Learning Analytics and Knowledge 2021, Virtual Conference, 15-04-2021*.

2021

Schumacher, Clara and Jakub Kuzilek. "Perfect Match? Investigating Students' Perceptions About Algorithmic Grouping in Higher Education". In: *Accepted for presentation at 2021 AECT International Convention*.

- 2020
Klamka, Ralf, Peter de Lange, Alexander Tobias Neumann, Benedikt Hensen, Milos Kravcik, Xia Wang, and Jakub Kuzilek. "Scaling Mentoring Support with Distributed Artificial Intelligence". In: *Intelligent Tutoring Systems*. Ed. by Vivekanandan Kumar and Christos Troussas. Cham: Springer International Publishing, pp. 38–44.
- 2020
Kuzilek, Jakub, Zdenek Zdrahal, Jonas Vaclavek, Viktor Fuglik, and Jan Skocilas. "Exploring Exam Strategies of Successful First Year Engineering Students". In: *Proceedings of the Tenth International Conference on Learning Analytics & Knowledge*. LAK '20. Frankfurt, Germany: Association for Computing Machinery, pp. 124–128.
- 2019
Kuzilek, Jakub, Jonas Vaclavek, Zdenek Zdrahal, and Viktor Fuglik. "Analysing Student VLE Behaviour Intensity and Performance". In: *European Conference on Technology Enhanced Learning*. Springer, pp. 587–590.
- 2018
Kuzilek, J. and Vaclavek, J. and Fuglik, V., and Zdrahal, Z. "Student Drop-out Modelling Using Virtual Learning Environment Behaviour Data". English. In: *Lifelong Technology-Enhanced Learning. EC-TEL 2018*. Vol. 11082. Lecture Notes in Computer Science. Leeds, pp. 166–171.
- 2018
Vaclavek, J. and Kuzilek, J. and Skocilas, J. and Zdrahal, Z., and Fuglik, V. "Learning Analytics Dashboard Analysing First-Year Engineering Students". English. In: *Lifelong Technology-Enhanced Learning. EC-TEL 2018*. Vol. 11082. Lecture Notes in Computer Science. Leeds, pp. 575–578.
- 2016
Wolff, A. and Moore, J. and Zdrahal, Zdenek and Hlosta, M., and Kuzilek, Jakub. "Data literacy for learning analytics". In: *Proceedings of the Sixth International Conference on Learning Analytics & Knowledge*. New York, US, pp. 500–501.
- 2015
Herrmannova, D. and Hlosta, M. and Kuzilek, J., and Zdrahal, Z. "Evaluating weekly predictions of at-risk students at the Open University: results and issues". In: *Proceedings of the European Distance and E-Learning Network 2015 Annual Conference*. Budapest, HU, pp. 200–208.
- 2014
Hlosta, M. and Herrmannova, D. and Vachova, L. and Kuzilek, J. and Zdrahal, Z., and Wolff, A. "Modelling Student Online Behaviour in a Virtual Learning Environment". In: *Proceedings of the 4th International Conference on Learning Analytics and Knowledge*. New York, US, pp. 1–4.
- 2014
Kuzilek, J. and Kremen, V., and Lhotska, L. "Comparison of JADE and Canonical Correlation Analysis for ECG de-noising". In: *Proceedings of 36th Annual International Conference of the IEEE Engineering in Medicine and Biology Society*. Piscataway, US, pp. 3857–3860.

- 2014
Wolff, Annika and Zdrahal, Z. and Herrmannova, D. and Kuzilek, J., and Hlosta, M. "Developing Predictive Models for Early Detection of at-risk Students on Distance Learning Modules". In: *Proceedings of the 4th International Conference on Learning Analytics and Knowledge*. New York, US, pp. 1–4.
- 2013
Kuzilek, J. and Lhotska, L. "Advanced Signal Processing Techniques for Fetal ECG Analysis". English. In: *Computing in Cardiology 2013*. Brussels, BE, pp. 177–180.
- 2013
Kuzilek, J. and Lhotska, L. "Beat Detection Enhancing Using AdaBoost". English. In: *Proceedings of the International Conference on Bio-inspired Systems and Signal Processing*. Porto, PT, pp. 280–283.
- 2013
Kuzilek, J. and Lhotska, L., and Huptych, M. "Extraction of Beats from Noisy ECG Using ICA". English. In: *IFMBE Proceedings: World Congress on Medical Physics and Biomedical Engineering*. Heidelberg, DE, pp. 469–472.
- 2013
Lhotska, L. and Kuzilek, J. and Chudacek, V. and Novak, P. and Novak, D., and Havlik, J. "Case Studies of Students Involvement in Research". English. In: *Proceedings of the 24th Annual Conference on Proceedings of the 24th Annual Conference on European Association for Education in Proceedings of the 24th Annual Conference on European Association for Education in p Electrical and Information Engineering*. Piscataway, US, pp. 204–209.
- 2012
Macas, M. and Kuzilek, J. and Huptych, M., and Odstrcilik, T. "Linear Bayes Classification for Mortality Prediction". English. In: *Computing in Cardiology 2012*. New York, US, pp. 1–4.
- 2012
Odstrcilik, T. and Kuzilek, J. and Chudacek, V., and Lhotska, L. "Scoring System for 12 Lead ECG Quality Assessment". English. In: *Computing in Cardiology 2012*. New York, US, pp. 1–3.
- 2011
Chudacek, V. and Zach, L. and Kuzilek, J. and Spilka, J., and Lhotska, L. "Simple Scoring System for ECG Signal Quality Assessment on Android Platform". English. In: *Computing in Cardiology*. Piscataway, US, pp. 449–451.
- 2011
Kuzilek, J. and Huptych, M. and Chudacek, V. and Spilka, J., and Lhotska, L. "Data Driven Approach to ECG Signal Quality Assessment using Multistep SVM Classification". English. In: *Computing in Cardiology*. Piscataway, US, pp. 453–455.
- 2011
Kuzilek, J. and Lhotska, L., and Hanuliak, M. "An Automatic Method for Holter ECG Denoising Using ICA". English. In: *In ACM Digital Library: Proceedings of 4th International Symposium on Applied Sciences in Biomedical and Communication Technologies*. New York, US, pp. 1–5.

- 2011
Kuzilek, J. and Spilka, J. and Kremen, V., and Lhotska, L. "Multimedia Support in Education of ECG Signal Analysis". English. In: *IFMBE Proceedings*. IFMBE Proceedings. Berlin, DE, pp. 1378–1381.
- 2011
Zach, L. and Chudacek, V. and Spilka, J. and Huptych, M. and BurSa, M. and Kuzilek, J. and Lhotska, L., and Janku, P. "Mobile CTG Fetal Heart Rate Assessment using Android Platform". English. In: *Computing in Cardiology*. Piscataway, US, p. 66.
- 2010
Kuzilek, J. and Lhotska, L., and Hanuliak, M. "Processing Holter ECG signal corrupted with noise: Using ICA for QRS complex detection". English. In: *Conference Proceedings of The 3rd International Symposium on Applied Sciences in Biomedical and Communication Technologies*. Rome, IT, pp. 1–4.
- 2010
Kuzilek, J. and Spilka, J. and Lhotska, L., and Hanuliak, M. "Detection of Myocardial Infarction Using ICA". English. In: *Analysis of Biomedical Signals and Images, BIOSIGNAL 2010, Proceedings*. Brno, CZ, pp. 118–121.
- 2010
Spilka, J. and Chudacek, V. and Kuzilek, J. and Lhotska, L., and Hanuliak, M. "Detection of Inferior Myocardial Infarction: A Comparison of Various Decision Systems and Learning Algorithms". English. In: *Computing in Cardiology 2010 Preprints*. New Jersey, US, pp. 273–276.
- 2010
Spilka, J. and Kuzilek, J. and Chudacek, V. and Lhotska, L., and Hanuliak, M. "Using One-Rule Algorithm To Find Optimal Thresholds For Detection Of Inferior Myocardial Infarction". English. In: *Analysis of Biomedical Signals and Images, BIOSIGNAL 2010, Proceedings*. Brno, CZ, pp. 233–239.
- 2010
Vavrecka, M. and Lhotska, L., and Kuzilek, J. "Classification of the EEG feature components". English. In: *10th International Conference on Information Technology and Applications in Biomedicine*. Crete, GR.

Other Publications

- 2021
"First-year engineering students' strategies for taking exams". International Journal of Artificial Intelligence in Education (under review).
- 2020
Marmolejo-Ramos, Fernando, Mauricio Tejo, Marek Brabec, Jakub Kuzilek, Srecko Joksimovic, Vitomir Kovanović, Jorge González, and Raydonal Ospina. "Distributional regression analysis of learning analytics and educational data". SocArXiv (preprint).