JOHN M. AIKEN

Vestgrensa 24, Blindern 0851 Oslo, NORWAY | +47 40 47 71 89 | johnm.aiken@gmail.com | google scholar | github **EDUCATION** Ph. D. **Department of Physics** University of Oslo 2020 Dissertation: Understanding University Student Pathways Towards Graduation with Machine Learning and Institutional Data Master of Science **Department of Physics and Astronomy** Georgia State University 2013 Thesis: Transforming High School Physics with Modeling and Computation **Bachelor of Science Department of Physics and Astronomy** Georgia State University 2010 Major: Physics and Astronomy PROFESSIONAL APPOINTMENTS Researcher Department of Physics, Njord Centre University of Oslo March 2021 to present Researcher **Department of Physics, Centre for Computing in Science Education** University of Oslo September 2020 to February 2021 **Data Science PhD Intern Data Science Group** Domos August 2019 - December 2019 **PhD Candidate Department of Physics, Centre for Computing in Science Education** University of Oslo September 2017 to September 2020 **PhD Candidate** Section 2.6 - Seismic Hazard and Risk Dynamics **GFZ-Potsdam** February 2016 - September 2017 Software Developer JILA University of Colorado, Boulder June 2015 - January 2016 Research Associate I **School of Physics** Georgia Institute of Technology December 2013 - June 2015 **GRANTS AWARDS** The Njord Centre Summer Award 2019 The Njord Centre Diversity Award 2018 Physics Education Research Topical Group Travel Grant (500 USD) 2018 Paper selected as Notable Paper of the Physics Education Research Conference Proceedings 2016 Physics Education Research Topical Group Travel Grant (500 USD) 2016 Physics Education Research Topical Group Travel Grant (500 USD) 2015 Best Graduate Student Poster, North Carolina Section of American Association of Physics Teachers 2013 Best Graduate Student Poster, North Carolina Section of American Association of Physics Teachers 2011 TEACHING EXPERIENCE

University of Potsdam 2016 - 2017
The Georgia Institute of Technology 2012 - 2014
Georgia State University 2010 - 2012

SERVICE

Peer Reviewer

Journal of Geophysical Research - Solid Earth 2020 - present

Workshop FacilitatorAmerican Association of Physics Teachers Meeting

Machine Learning in Physics Education Research

2019

Internship Facilitator

Educational Data Mining Summer Internship

University of Oslo Centre for Computing in Science Education

2018 - 2019

Guest Edito

Focused Collection on Quantitative Methods in PER: A Critical Examination

Physical Review Physics Education Research

2018 - 2019

Peer Reviewer

Physical Review Physics Education Research

2017 - present

Peer Reviewer

The Physics Teacher

2017 - present

Research Track Committee Member

EMOOCS Conference

2017

2013 - 2015

Committee Member

Committee on Educational Technologies

American Association of Physics Teachers

INVITED TALKS

A New Framework for Evaluating Statistical Models in Physics Education Research University College Dublin	2020
Investigating Physics Students Pathways Georgia State University	2016
From Physics to Data Science Texas State University	2016
Student Engagement with Video Course Content in Introductory Mechanics American Association of Physics Teachers Meeting	2015
Using the Tools of Online Analytics and Big Data in the On-Campus Classroom Physics Education Research Conference	2014
What Do We Learn From Students Watching Lecture Videos? University of Colorado, Boulder	2014

PUBLICATIONS — MACHINE LEARNING IN GEOPHYSICAL PROCESSES

- [1] Coline Bouchayer, John M. Aiken, Kjetil Thørgersen, Thomas V. Schuler, and François Renard. "Gradient boosting predicts and explains surge-type glaciers in Svalbard". In: *Journal of Geophysical Research Solid Earth* (In Preparation).
- [2] Jessica McBeck, John M. Aiken, Benoit Cordonnier, Yehuda Ben-Zion, and François Renard. "Predicting fracture network development in crystalline rocks". In: *Journal of Geophysical Research Solid Earth* (In Review).
- [3] Jessica McBeck, John M. Aiken, Benoit Cordonnier, and François Renard. "How accurate are we Part 2: The influence of segmentation method on fracture network properties calculated from X-ray microtomography data". In: *Journal of Geophysical Research Solid Earth* (In Preparation).
- [7] Jessica Ann McBeck, John M. Aiken, Joachim Mathiesen, Yehuda Ben-Zion, and François Renard. "Deformation precursors to catastrophic failure in rocks". In: *Geophysical Research Letters* 47.24 (2020), e2020GL090255. DOI: 10.1029/2020GL090255.
- [8] Jessica McBeck, John M. Aiken, Yehuda Ben-Zion, and François Renard. "Predicting the proximity to macroscopic failure using local strain populations from dynamic in situ X-ray tomography triaxial compression experiments on rocks". In: Earth and Planetary Science Letters 543 (2020), p. 116344. DOI: 10.1016/j.epsl.2020.116344.
- [10] Jessica McBeck, Neelima Kandula, John M. Aiken, Benoit Cordonnier, and François Renard. "Isolating the factors that govern fracture development in rocks throughout dynamic in situ X-ray tomography experiments". In: *Geophysical Research Letters* 46.20 (2019), pp. 11127–11135. DOI: 10.1029/2019GL084613.
- [16] John M. Aiken, Chastity Aiken, and Fabrice Cotton. "A Python library for teaching computation to seismology students". In: Seismological Research Letters 89.3 (2018), pp. 1165–1171. DOI: 10.1785/0220170246.

PUBLICATIONS — EDUCATIONAL DATA MINING

- [4] Joseph Wilson, Benjamin Pollard, John M. Aiken, Marcos D. Caballero, and H.J. Lewandowski. "Classification of Open-Ended Responses to a Research-Based Assessment Using Natural Language Processing". In: *Physical Review Physics Education Research* (In Preparation).
- [5] John M. Aiken and H.J. Lewandowski. "Data sharing model using the Colorado Learning Attitudes about Science Survey for Experimental Physics 70000 response data set". In: *Physical Review Physics Education Research* (In Review).
- [6] John M. Aiken, Riccardo De Bin, H.J. Lewandowski, and Marcos D. Caballero. "A new framework for evaluating statistical models in physics education research". In: *Physical Review Physics Education Research* (In Review).
- [9] John M. Aiken, Riccardo De Bin, Morten Hjorth-Jensen, and Marcos D. Caballero. "Predicting time to graduation at a large enrollment American university". In: *Plos one* 15.11 (2020), e0242334. DOI: 10.1371/journal.pone.0242334.

- [11] John M. Aiken, Rachel Henderson, and Marcos D. Caballero. "Modeling student pathways in a physics bachelor's degree program". In: *Physical Review Physics Education Research* 15 (1 May 2019), p. 010128. URL: https://link.aps.org/doi/10.1103/PhysRevPhysEducRes.15.010128.
- [12] Alexis V. Knaub, John M. Aiken, and Marcos D. Caballero. "Editorial: Focused Collection: Quantitative Methods in PER: A Critical Examination". In: *Physical Review Physics Education Research* 15 (2 July 2019), p. 020001. DOI: 10.1103/PhysRevPhysEducRes.15.020001.
- [13] Alexis V. Knaub, John M. Aiken, and Lin Ding. "Two-phase study examining perspectives and use of quantitative methods in physics education research". In: *Physical Review Physics Education Research* 15.2 (2019). URL: https://journals.aps.org/prper/abstract/10.1103/PhysRevPhysEducRes.15.020102.
- [14] Nicholas T. Young, Grant Allen, John M. Aiken, Rachel Henderson, and Marcos D. Caballero. "Identifying features predictive of faculty integrating computation into physics courses". In: *Physical Review Physics Education Research* 15.1 (2019). DOI: 10.1103/PhysRevPhysEducRes.15.010114.
- [15] Robert Solli, John Aiken, Rachel Henderson, and Marcos Caballero. "Examining the relationship between student performance and video interactions". In: *Physics Education Research Conference* 2018. PER Conference. Washington, DC, Aug. 2018. URL: https://arxiv.org/abs/1807.01912.
- [17] Scott S. Douglas, John M. Aiken, Edwin F. Greco, Michael F. Schatz, and Shih-Yin Lin. "Do-it-yourself whiteboard-style physics video lectures". In: *The Physics Teacher* 55.1 (2017), pp. 22–24. DOI: 10.1119/1.4972492.
- [18] John M. Aiken and Marcos D. Caballero. "Methods for Analyzing Pathways through a Physics Major". In: 2016 Physics Education Research Conference Proceedings. Ed. by D.L. Jones, L. Ding, and A. Traxler. Sacremento, CA, July 2016, pp. 28–31. DOI: 10.1119/perc.2016.pr.002.
- [19] Bethany R. Wilcox, Benjamin M. Zwickl, Robert D. Hobbs, John M. Aiken, Nathan M. Welch, and H. J. Lewandowski. "Alternative model for administration and analysis of research-based assessments". In: *Physical Review Physics Education Research* 12 (1 June 2016), p. 010139. DOI: 10.1103/PhysRevPhysEducRes.12.010139.
- [20] Shih-Yin Lin, John M. Aiken, Daniel T. Seaton, Scott S. Douglas, Edwin F. Greco, Brian D. Thoms, and Michael F. Schatz. "Exploring physics students' engagement with online instructional videos in an introductory mechanics course". In: Physical Review Physics Education Research 13.2 (2017). DOI: 10.1103/PhysRevPhysEducRes.13.020138.
- [21] Scott S. Douglas, John M. Aiken, Shih-Yin Lin, Edwin F. Greco, Emily Alicea-Muñoz, and Michael F. Schatz. "Peer assessment of student-produced mechanics lab report videos". In: *Physical Review Physics Education Research* 13.2 (2017). DOI: 10.1103/PhysRevPhysEducRes.13.020126.
- [22] Shih-Yin Lin, Scott S. Douglas, John M. Aiken, Liu Chien-Lin, Edwin F. Greco, Brian D. Thoms, Marcos D. Caballero, and Michael F. Schatz. "Peer evaluation of video lab reports in an introductory physics MOOC". In: 2014. URL: https://arxiv.org/abs/1407.4714.
- [23] Scott S. Douglas, Shih-Yin Lin, John M. Aiken, Brian D. Thoms, Edwin F. Greco, Marcos D. Caballero, and Michael F. Schatz. "Peer evaluation of video lab reports in a blended introductory physics course". In: 2014. URL: https://arxiv.org/abs/1407.3248.
- [24] Marcos D. Caballero, John B. Burk, John M. Aiken, Brian D. Thoms, Scott S. Douglas, Erin M. Scanlon, and Michael F. Schatz. "Integrating numerical computation into the modeling instruction curriculum". In: *The Physics Teacher* 52.1 (2014), pp. 38–42. DOI: 10.1119/1.4849153.
- [25] John M. Aiken, Shih-Yin Lin, Scott S. Douglas, Edwin F. Greco, Brian D. Thoms, Michael F. Schatz, and Marcos D. Caballero. "The initial state of students taking an introductory physics MOOC". In: 2013. URL: https://arxiv.org/abs/1307. 2533.
- [26] John M. Aiken, Marcos D. Caballero, Scott S. Douglas, John B. Burk, Erin M. Scanlon, Brian D. Thoms, and Michael F. Schatz. "Understanding student computational thinking with computational modeling". In: vol. 1513. 2013, pp. 46–49. DOI: 10.1063/1.4789648.

REFERENCES

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