# RYAN C. A. FOLEY

in Linkedin Twitter



Curriculum Vitae

# Education

2020–present **PhD (Candidate), Neuromechanics & Ergonomics**, Faculty of Health Sciences, Ontario Tech University, Oshawa, Ontario, Canada.

Towards the development of an ergonomics fatigue exposure thresholds during complex repetitive work

Github

Advisor : Dr. Nicholas La Delfa

2012–2015 **MSc, Neurophysiology**, Faculty of Science, Wilfrid Laurier University, Waterloo, Ontario, Canada.

Estimates of persistent inward current in human motor neurons during postural sway

Advisor: Dr. Jayne Kalmar

2008–2012 **BSc, Kinesiology**, Faculty of Science, Wilfrid Laurier University, Waterloo, Ontario, Canada. Undergraduate Thesis: Training-induced adaptation of interhemispheric inhibition

Graduated with honors

Advisor: Dr. Jayne Kalmar

## Publications

#### Refereed Journal Articles (n=8)

- 2022 Abdel-Malek, D. M., Foley, Ryan R. C. A., Wakeely, F., Graham, J. D., and La Delfa, N. J. Exploring localized muscle fatigue responses at current upper-extremity ergonomics threshold limit values. *Human Factors*, volume 64, pages 385–400, 2022.
- 2021 DeBoon, B., Foley, R. C. A., Nokleby, S., La Delfa, N. J., and Rossa, C. Nine degree-of-freedom kinematic modeling of the upper-limb complex for constrained workspace evaluation. *Journal of Biomechanical Engineering*, volume 143, page 021009, 2021.
- 2021 Cregg, A. C., Foley, R. C. A., Livingston, L. A, and La Delfa, N. J. A biomechanical evaluation of different footrest heights during standing computer work. *Ergonomics*, volume 64, pages 342–353, 2021.
- 2021 Callaghan, D. H., Foley, R. C. A., Forman, G. N., Holmes, M. W. R, and La Delfa, N. J. Scoping review of the effects of handedness on upper limb strength. *Cureus Journal of Medical Science*, 2021.
- 2021 Abdel-Malek, D. M., Foley, Ryan R. C. A., Wakeely, F., Graham, J. D., and La Delfa, N. J. Calibrating ratings of perceived fatigue relative to objective measures of localised muscle fatigue using a feedback-based familiarisation protocol. *Theoretical Issues in Ergonomics Science*, volume 22, pages 511–527, 2021.
- 2019 Foley, Ryan CA and Kalmar, Jayne M. Estimates of persistent inward current in human motor neurons during postural sway. *Journal of Neurophysiology*, volume 122, pages 2095–2110, 2019.

- 2019 Dogra, S., Wolf, M., Jeffrey, M. P., Foley, R. C. A., Logan-Sprenger, H., Jones-Taggart, H., and Green-Johnson, J. M. Disrupting prolonged sitting reduces il-8 and lower leg swell in active young adults. *BMC Sports Science, Medicine and Rehabilitation*, volume 11, pages 1–7, 2019.
- 2017 Foley, R. C. A., Bulbrook, B. D., Button, D. C., and Holmes, M. W. R. Effects of a band loop on lower extremity muscle activity and kinematics during the barbell squat. *International journal of sports physical therapy*, volume 12, page 550, 2017.

## Articles in review or submitted for publication (n=1)

Foley, R. C. A., Callaghan, D. H., Forman, G. N., Graham, J. D., Holmes, M. W. R., and La Delfa, N. J. A comprehensive scoping review and meta-analysis of upper limb strength asymmetry. *Under review with Scientific Reports*.

## Manuscripts in preparation for publication (n=4)

Wakeely, F., Foley, R. C. A., Watterworth, M. W. B., and La Delfa, N. J. Bi-lateral manual arm strength differs in right and left-handed individuals. *To be submitted to Human Factors*.

Hawke, K., Foley, R. C. A., Copithorne, D., Gavel, E., La Delfa, N. J., and Logan-Sprenger, H. The neuromuscular effects of menthol supplementation during a performance cycling test battery in heat stress.

Foley, R. C. A., MacMillan, V., and Tanaka, T. D. aand Nugent, K. The application of force plate technology for the forensic examination of stamping devices.

Foley, R. C. A., La Delfa, N. J., Sutherland, C. A., and Potvin, J. R. High pass filtering and whitening improves sub-maximal dynamic quadriceps emg-to-moment estimations. *To be submitted to Medicine and Science in Sports and Exercise*.

# Technical Reports (n=1)

2018 Foley, R. C. A., Abdel-Malek, D. M., Russell, M. S., and La Delfa, N. J. Biomechanical assessment of shoulder exposures and fatigue during simulated wingsuit flight. *9 pages. Submitted to UOIT Automotive Centre of Excellence & Dr. Angelo Grubesic. August*, 2018.

## Invited Presentations & Lectures (n=15)

- 2024 Foley, R. C. A. Talk Name?, GM Safety Day Ergonomics Working Group, Ontario Tech University, Oshawa, ON, CAN.
- 2024 Foley, R. C. A. Mechanisms and Methods in Neuromuscular Fatigue, KINE2130 Exercise Physiology, Ontario Tech University, Oshawa, ON, CAN.
- 2023 Foley, R. C. A. and La Delfa, N. J. Simulating force-time history order effects on muscle fatigue: implications for work/rest scheduling and job rotation, Center for Research Excellence in Musculoskeletal Disorders (CRE-MSD) | 2023 Research Day Meeting, Waterloo, ON, CAN. May 2023.
- 2023 Foley, R. C. A. Mechanisms and Methods in Neuromuscular Fatigue, KINE2130 Exercise Physiology, Ontario Tech University, Oshawa, ON, CAN.
- 2022 Foley, R. C. A. Wearable Tech Born out of Research Instruments, HLSC5322 Theory and Application of Biomedical Signals and Images, Ontario Tech University, Oshawa, ON, CAN.
- 2022 Foley, R. C. A. Mechanisms and Methods in Neuromuscular Fatigue, KINE2130 Exercise Physiology, Ontario tech University, Oshawa, ON, CAN.
- 2019 Foley, R. C. A. Structural vs. Functional Brain Changes After Head Injury, Health Promotion in Diverse Populations, Durham College, Oshawa, ON, CAN.
- 2021 Foley, R. C. A. Wearable Tech Born out of Research Instruments, HLSC5322 Theory and Application of Biomedical Signals and Images, Ontario Tech University, Oshawa, ON, CAN.
- 2021 Foley, R. C. A. Mechanisms and Methods in Neuromuscular Fatigue, KINE2130 Exercise Physiology, Ontario Tech University, Oshawa, ON, CAN.

- 2020 Foley, R. C. A. Wearable Tech Born out of Research Instruments, HLSC5322 Theory and Application of Biomedical Signals and Images, Ontario Tech University, Oshawa, ON, CAN.
- 2019 Foley, R. C. A. Wearable Tech Born out of Research Instruments, HLSC5322 Theory and Application of Biomedical Signals and Images, Ontario Tech University, Oshawa, ON, CAN.
- 2018 Foley, R. C. A. Wearable Tech Born out of Research Instruments, HLSC5322 Theory and Application of Biomedical Signals and Images, Ontario Tech University, Oshawa, ON, CAN.
- 2017 Foley, R. C. A. Wearable Tech Born out of Research Instruments, HLSC5322 Theory and Application of Biomedical Signals and Images, Ontario Tech University, Oshawa, ON, CAN.
- 2016 Foley, R. C. A. Introduction to Writing Filters using Microsoft Excel, HLSC5322 Theory and Application of Biomedical Signals and Images, Ontario Tech University, Oshawa, ON, CAN.
- 2014 Foley, R. C. A. Intrinsic Mechanisms of Alpha Motor Neuron Gain, KP425 Neuromuscular Function in Exercise, Wilfrid Laurier University, Waterloo, ON, CAN.
- 2013 Foley, R. C. A. A Neuromuscular Approach to Muscle Cramps during Long-Duration Exercise, KP422 Advanced Exercise Physiology, Wilfrid Laurier University, Waterloo, ON, CAN.
- 2013 Foley, R. C. A. TMS: An Introduction to MEPs and Paired-Pulse Research, Musculoskeletal Disorders Research Centre, Wilfrid Laurier University, Waterloo, ON, CAN.
  Refereed Conference Proceedings (n=11)
- 2024 Lywood, H., Foley, R. C. A., and Lloyd, M. Gross motor skill proficiency and physical activity in children with autism spectrum disorder: A correlational study. North American Federation of Adapted Physical Activity 2024 Annual General Meeting. Ithaca, NY, USA. September, 2024.
- 2024 Foley, R. C. A. and La Delfa, N. J. Examination of work breaks and job rotation using a motor-unit based fatigue model. International Ergonomics Association 2024 Triennial General Meeting. Seogwipo, Jeju, Republic of Korea. August, 2024.
- 2024 Foley, R. C. A., Callaghan, D. H., Forman, G. N., Graham, J. D., Holmes, W. R., and La Delfa, N. J. A scoping review of upper limb strength asymmetry for ergonomics. International Ergonomics Association 2024 Triennial General Meeting. Seogwipo, Jeju, Republic of Korea. August, 2024.
- 2023 Foley, R. C. A., Watterworth, M. W. B., Issa, J. M., and La Delfa, N. J. Probing the influence of exertion/rest pacing on predicted muscle fatigue. American College of Sports Medicine Annual General Meeting, Denver, CO, USA. May, volume 55, page 236, 2023.
- 2023 Foley, R. C. A., Callaghan, D. H., Forman, G. N., Graham, J. D., Holmes, W. R., and La Delfa, N. J. A scoping review on the effect of hand dominance on upper extremity strength. The 26th Annual Applied Ergonomics Conference New Orleans, Louisiana, USA. March, 2023.
- Wakeely, F., Watterworth, M. W. B., Foley, R. C. A., and La Delfa, N. J. Exploring the biomechanical basis for a strength asymmetry between dominant and non-dominant arms. Exploring the biomechanical basis for a strength asymmetry between dominant and non-dominant arms. North American Congress on Biomechanics (NACOB). Ottawa, Ontario, Canada. August, 2022.
- 2022 La Delfa, N. J. and Foley, R. C. A. Using empirical and computational models of muscle fatigue to develop and validate repetitive work thresholds in ergonomics. XXIV Congress of the International Society of Electrophysiology & Kinesiology. Quebec City, Quebec, Canada. June, 2022.
- 2022 Foley, R. C. A. and La Delfa, N. J. Examining the influence of exertion/rest order effects on predicted muscle fatigue: a simulation study. XXIV Congress of the International Society of Electrophysiology & Kinesiology. Quebec City, Quebec, Canada. June, 2022.
- 2021 Foley, R. C. A., Abdel-Malek, D. M., Wakeely, F., Graham, J. D., and La Delfa, N. J. Validating the upper limb localized muscle fatigue physical exposure limits. The 21st Biennial Meeting of the Canadian Society for Biomechanics. May, 2021.

- 2021 Cregg, A. C., Foley, R. C. A., Livingston, L., and La Delfa, N. J. An examination of different footrest heights during standing computer work. The 21st Biennial Meeting of the Canadian Society for Biomechanics. May, 2021.
- 2019 La Delfa, N. J., F., Wakeely., Abdel-Malek, D. M., Foley, R. C. A., and Graham, J. D. Experimental repeatability of an upper extremity muscle fatigue protocol. XXVII Congress of the International Society of Biomechanics & 43rd Annual Meeting of the American Society of Biomechanics. Calgary, Alberta, Canada. August, 2019.
- 2018 Wolf, M., Jeffrey, M. P., Foley, R. C. A., Logan-Sprenger, H., Jones-Taggart, H., Green-Johnson, J. M., and Dogra, S. Disrupting prolonged sitting reduces il-8 and lower leg swell in active young adults. Canadian Society for Exercise Physiology 2019 Annual General Meeting. Niagara Falls, Ontario, CAN. October, 2018.
- 2014 Foley, R. C. A. and Kalmar, J. M. Estimates of persistent inward current in human motor neurons during postural sway. The Society for Neuroscience Annual Meeting. Washington D.C, USA. November, 2014.
- 2013 Foley, R. C. A. and Kalmar, J. M. Training induced adaptation of interhemispheric inhibition. In American College of Sports Medicine Annual General Meeting, Indianapolis, IN, USA. May, 2013.

  Non-refereed Conference Presentations & Posters (n=15)
- 2023 Issa, J., Foley, R. C. A., and La Delfa, N. J. Impact of force-time histories on a motor unit-based model for predicting muscle fatigue. 12th Annual Research Practicum Poster Day. UOIT, Oshawa, Ontario. April, 2023.
- 2023 Foley, R. C. A. and La Delfa, N. J. Modeling the effect of unique force-time histories on predicted muscle fatigue. Ontario Biomechanics Conference (OBC), Waterloo, Ontario. May, 2023.
- 2022 Callaghan, D. H., Foley, R. C. A., Forman, G. N., Holmes, M. W. R, and La Delfa, N. J. Scoping review of the effects of handedness on upper limb strength. 11th Annual Research Practicum Poster Day. UOIT, Oshawa, Ontario. April, 2022.
- 2020 Wakeely, F., Norman, S., Watterworth, M. W. B., Foley, R. C. A., and La Delfa, N. J. The effect of handedness on manual arm strength. 17th Ontario Biomechanics Conference, Aliston, Ontario. (conference postponed last minute due to COVID-19) March, 2020.
- 2020 Foley, R. C.A., Abdel-Malek, D. M., Wakeely, F., Graham, J. D., and La Delfa, N. J. valuating muscle fatigue at current ergonomics threshold limit value exposure levels. 17th Ontario Biomechanics Conference, Aliston, Ontario. (conference postponed last minute due to COVID-19) March, 2020.
- 2019 Wakeely, F., Abdel-Malek, D. M., Foley, R. C. A., Graham, J. D., and La Delfa, N. J. Experimental repeatability of an upper extremity muscle fatigue protocol. 16th Ontario Biomechanics Conference, Aliston, Ontario. March, 2019.
- 2019 Wakeely, F. Abdel-Malek, D. M., Foley, R. C. A., Graham, J. D., and La Delfa, N. J. Experimental repeatability of an upper extremity muscle fatigue protocol. 11th Annual Research Practicum Poster Day. UOIT, Oshawa, Ontario. April , 2019.
- 2019 Abdel-Malek, D. M., Wakeely, F., Foley, R. C. A., Graham, J. D., and La Delfa, N. J. Does feedback training improve ratings of perceived fatigue during a repetitive upper extremity task? Southern Ontario Motor Behaviour Symposium. University of Toronto, Toronto, Ontario. May, 2019.
- 2019 Abdel-Malek, D. M, Wakeely, F., Foley, R. C. A., Graham, J. D., and La Delfa, N. J. Can a period of familiarization improve ratings of perceived fatigue relative to objective measures of muscle fatigue? 16th Ontario Biomechanics Conference, Aliston, Ontario. March, 2019.
- 2018 Dogra, S., Wolf, M., Jeffrey, M. P., Foley, R. C. A., Logan-Sprenger, H., Jones-Taggart, H., and Green-Johnson, J. M. Disrupting prolonged sitting reduces il-8 and lower leg swell in active young adults. 10th Annual Research Practicum Poster Day. UOIT, Oshawa, Ontario. April, 2018.

- 2018 Cregg, A. C., Foley, R. C. A., La Delfa, N. J., and Livingston, L. Changes in lumbar spine posture, muscle activation and centre of pressure while performing standing work with different footrest heights. 15th Ontario Biomechanics Conference, Aliston, Ontario. March, 2018.
- 2014 Foley, R. C. A. and Kalmar, J. M. Estimates of persistent inward current in human motor neurons during postural sway. Ontario Exercise Physiology, Barrie, Ontario. March, 2014.
- 2013 Foley, R. C. A. and Kalmar, J. M. The use of a novel bi-manual training task to induce changes in interhemisphereic cortical excitability. Ontario Exercise Physiology, Barrie, Ontario. March, 2013.
- 2013 Foley, R. C. A. and Kalmar, J. M. Training induced adaptation of interhemispheric inhibition. The 4th Annual Muscle Health Awareness Day, Muscle Health Research Centre at York University, North York, Ontario. MHAD POSTER AWARD FINALIST - MSc May, 2013.
- Foley, R. C. A. and Kalmar, J. M. Training induced adaptation of interhemispheric inhibition. 2013 Exercise and Neuroscience Group's Biennial Meeting. Oshawa, Ontario. June, 2013.

# Work Experience

Ontario Tech University, Oshawa, ON, CAN

## Aug 2014 - Kinesiology Lab Technician.

Present Managed all day to day operations of the Kinesiology Teaching Labs - 1800 student hours weekly and training of 30 Teaching assistants

Creation of custom instruments and experimental design for teaching

Managed the design, move and re-opening of four brand new lab spaces

#### Jan 2024 – Advanced Ergonomics Project Consultant.

Dec 2024 Management of lab budget, scheduling, TA allocation, and internships and designed a new space for department research and teaching labs

Managed the undergrad lab curriculum through COVID-19 pandemic safely

Hired and trained a replacement Kinesiology Lab Technician

#### Sept 2019 - Kinesiology Lab Specialist.

Sept 2020 Management of lab budget, scheduling, TA allocation, and internships and designed a new space for department research and teaching labs

Managed the undergrad lab curriculum through COVID-19 pandemic safely

Hired and trained a replacement Kinesiology Lab Technician

Cort Research and Innovation, Windsor, ON, CAN

#### Jan 2024 - Advanced Ergonomics Project Consultant.

Dec 2024 Evaluated work scheduling intervention efficacy for a Detroit-based automotive manufacturer using advanced neuromuscular fatigue prediction models

Consulted between a variety of parties in cutting-edge automotive assembly situations

Conducted several sensor-instrumented on-line data collections across a variety of North American plants for the purposes of building advanced job fatigue simulations

Monir Precision Monitoring, Mississauga, ON, CAN

#### May 2009 - **Inclinometer Monitoring Specialist**.

Sept 2011 Collected geostructural measurements of shoring deformations in large-scale excavation sites

Maintained and calibrated delicate equipment in hostile environments to ensure measurement accuracy

Produced detailed engineering reports to inform structural shoring design and tie-back interventions

# Teaching Experience

Ontario Tech University, Oshawa, Ontario, Canada

Sept., 2023 - **Sessional Instructor**.

May 2024 KINE4990 - Kinesiology Internship I

- Sept.,2020 **Sessional Instructor**.
  - May2021 HLSC4990 Kinesiology Internship I & II
- Sept., 2017 **Sessional Instructor**.
  - present HLSC4414U Advanced Topics in Neuromuscular Physiology

# Fellowships & Awards

- 2024 *Ontario Graduate Scholarship* PhD Health Sciences, Ontario Tech University \$15,000
- 2024 Mitacs Accelerate Program Industrial Research Internship Cort Research & Innovation Inc. Title: Experimental and modeling approaches to optimize repetitive task analysis in the automotive industry \$45,000
- 2023 NSERC Graduate Research Assistantship Dr. Nicholas La Delfa \$16,000
- 2022 **Center for Research Excellence in Musculoskeletal Disorders Seed Grant** Title: Computational and experimental evaluation of exertion/rest order effects on muscle fatigue development during complex repetitive work \$12,424
- 2022 NSERC Graduate Research Assistantship Dr. Nicholas La Delfa \$14,000
- 2022 **Professional Enhancement Review Subcommittee Travel Grant** XXIV Congress of the International Society of Electrophysiology & Kinesiology. Symposium presentation, Title: Examining the influence of exertion/rest order effects on predicted muscle fatigue: a simulation study \$425
- 2021 NSERC Graduate Research Assistantship Dr. Nicholas La Delfa \$17,000
- 2021 **NSERC Graduate Research Assistantship** Dr. Bernadette Murphy \$3,000
- 2020 NSERC Graduate Research Assistantship Dr. Nicholas La Delfa \$4,011
- 2019 'Fiercely Ontario Tech' Staff Award of Excellence Recognizes a frontline staff member who consistently strives to support a culture of service excellence. By their actions, this individual motivates and inspires the people around them to excel in service to students and/or staff and faculty at the university
- 2018 *UOIT Teaching and Learning Student Choice Award Nominee* For exceptional teaching dedication in HLSC4414U: Advanced Topics in Neuromuscular Physiology
- 2014 *Graduate Research Assistantship* Dr. Jayne Kalmar \$5,250
- 2020 *Muscle Health Awareness Day Poster Presentation Finalist* at The Muscle Health Research Centre at York University Title: Training induced adaptation of interhemispheric inhibition
- 2020 *Graduate Entrance Scholarship* Wilfrid laurier University, MSc Kinesiology, Supervisor Dr. Jayne Kalmar \$1,000
- 2013 Graduate Scholarship \$3,750
- 2013 Graduate Research Assistantship Dr. Jayne Kalmar \$5,500
- 2020 **Dean's List In-Program Scholarship** Wilfrid laurier University, BSc Kinesiology \$500
- 2022 **Professional Enhancement Review Subcommittee Travel Grant** International Society of Kinesiology and Electromyography, BSc Kinesiology \$425
- 2022 *Laurier FOSSA Award* International Society of Kinesiology and Electromyography, BSc Kinesiology \$700

## Relevant Coursework & Certificates

Advanced Biomechanics - Wilfrid Laurier University

Neuromuecular Function In Exercise - Wilfrid Laurier University

Research Methods I & II - Wilfrid Laurier University

Instrumentation in Biophysical Research - University of Waterloo

Statistical Reasoning & Experimental Analysis - Wilfrid Laurier University

Neurocognition of Movement - Wilfrid Laurier University

Interdisciplinary Perspectives in Health Data & Technology - Ontario Tech University

Advanced Concepts in Neuromechanics - Ontario Tech University

Critical Perspectives in Research & Knowledge Translation in HS - Ontario Tech University

Comprehensive Exams - Topics on Machine Learning and Baysian Methods for Muscle Fatigue Prediction - Ontario Tech University

Certificate in University Teaching - Ontario Tech University

Certificate in Fundamentals of Machine Learning - Coursera via Stanford University

# Computer skills

Programming Python, MATLab, R, LATEX

Languages

Signal CED Signal & Spike2, ADI LabChart, Basic NIC LabVIEW, OTBioLab

Aquisition

Advanced Visual3D, OpenSIM

Analysis and

Simulation

Ergonomics Process Simulate Tecnomatix Human, Santos, 3DSSPP, HandPak, Arm Force Field, Work(s)

& DHMs

CAD & 3D Autodesk Inventor, FormLabs

Printing

# Scientific Techniques

 ${\bf Biomchanics} \quad \textbf{Upper and Lower Body Kinematics} \quad {\bf Vicon, \ Optotrack, \ TheiaMarkerless, \ XSens, \ Maxtraq}$ 

Kinetics Force Plates • Exoskeletons • Factory & Custom Load Cells • Isokinetic Dynamometer

Neuophysiology Surface, Intramuscular, HDsEMG Electromyography(EMG), Transcranial Magnetic Stimula-

 $tion (TMS), \ Electroence phalography (EEG), \ Peripheral \ Nerve \ Stimulation$ 

Exercise Direct and Indirect Metabolic Tests, Cardiac Stress Testing, Spirometry, Environmental Physiology,

Physiology Blood Oxygenation via Near Infrared Spectroscopy (NIRS)

Institutional Committee Service

Ontario Tech University, Oshawa, Ontario, Canada

2022-present FHSc Graduate Program Committee.

2014-present Health Science Recruitment Representative.

2020-present Virtual Learning and Simulation Group.

2020-2022 COVID-19 Faculty Research Operation Committee.

Durham College, Oshawa, Ontario, Canada

2021-present Fitness & Health Promotion Program Advisory Committee.

Teaching Assistantships

Ontario Tech University, Oshawa, Ontario, Canada

Fall, 2022 KINE4477U: Applied Techniques in Neuromechanics.

Wilfrid Laurier University, Waterloo, Ontario, Canada

Winter, 2014 KP222: Human Physiology.

Fall, 2013 KP422: Advanced Exercise Physiology.

Fall, 2013 KP425: Neuromuscular Function in Exercise.

Winter, 2013 KP321: Exercise Physiology.

Fall, 2012 KP122: Biodynamical Aspects of Physical Activity.

Fall, 2012 KP425: Neuromuscular Function in Exercise.

## Volunteer Service

2017-present Ontario Tech Athletics - Muscle Strength Testing for ACL Injury Rehabilitation.

June 2017 Host - Special Olympics Canada Fitness Testing.

2017-2020 Ski Canada - Physiological Testing.

2014-present Ontario Tech Kinesiology Highschool Tour Sessions.

2014-2020 Ontario Tech Kinesiology Representative - Ontario Universities Fair.

# Previous Supervisors

#### Dr. Nicholas La Delfa

### Dr. Jayne Kalmar

Associate Professor, Department of Kinesiology
Wilfrid Laurier University

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