Welcome to our Spring 2019 ReGame-VR Lab Newsletter!

We are happy to share our 2018 activities with you! In 2018, we focused on analyzing and submitting study results, designing the methods and materials for two new studies, and collecting data! We welcomed our new Research Coordinator, Emily Chicklis, to the lab. We also focused a great deal on community engagement, including spending time getting feedback on our new technologies the Boston Children’s Museum and hosting lab tours for local school groups.

Key research findings from the lab in 2018!

- Therapists and clients at Franciscan Children’s Hospital and Spaulding Rehabilitation Hospital (Pediatrics) trialed the FITBoard, a rehab tool developed in the lab in collaboration with Enabling Engineering. There were strengths and weaknesses identified, which are shaping our next steps!
- Learning a new balance skill in a virtual environment in a narrative (story-based) context did not offer benefits for learning as compared to learning in a regular context.
- Practicing a new skill in a 2D flat-screen display virtual environment led to better performance as compared to acquiring the skill in a 3D head-mounted display virtual environment. However, skill did not transfer from the 2D to the 3D version of the skill.
- Learning a new skill in a more audio-Visually complex virtual environment did not improve performance as compared to a more audio-Visually simple virtual environment, but children’s motivation influenced their learning, regardless of environment type.
- The literature provides actionable advice about how to integrate virtual reality systems into rehabilitation with a clear match between therapist goals, client needs and environmental context.

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We are currently recruiting children with cerebral palsy and typically developing children for two studies in the lab!

Both studies consist of two, 1-1.5 hour sessions in the lab, 1-7 days apart. Families will receive a $40 gift card for each child who takes part in a study. We have availability during the day, evenings, and weekends. Parking or MBTA travel is reimbursed. We are very grateful for the support of the Boston Children’s Hospital Cerebral Palsy Clinic in our recruitment efforts, as well as the efforts of all of our participating sites! Thank you so much for spreading the word about our research studies!

### How do children learn a new throwing skill?

We are doing this study to understand how children with cerebral palsy and typically developing children learn a new throwing skill. We would like to understand whether practice conditions that allow for multiple solutions to skill success are more or less effective than practice conditions that allow for only one solution to skill success. We are also interested in how learning the skill in each condition transfers to a new real-life skill!

This research study is funded by the National Institutes of Health.

Screening survey for children with cerebral palsy: [click here](#)

Screening survey for typically-developing children: [click here](#)

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### How does practice in a virtual environment enhance movement skill learning?

We are doing this study to understand how children with CP and typically developing children learn a new balance skill in virtual versus physical environments. We would like to understand whether practice in a video game environment, a head mounted display virtual reality environment, or a regular environment is better for learning a new balance task. We are also interested in how learning the new skill transfers to the other environments.

This research is necessary because video games in virtual environments are being used frequently in physical therapy and because new 3D head-mounted displays will soon be low cost and widely-accessible, so we should understand whether they offer advantages over 2D flat-screen displays.

Our study is the first to explore mechanisms that may enhance transfer from virtual reality to real life skills in children with CP. The results will help researchers design better virtual environments and assist physical therapists in understanding which virtual environments most improve the movement skills of children with CP. Ultimately, this will enhance the quality of physical therapy treatments that use these tools and promote optimal functional outcomes for children with CP and other developmental disabilities.

This research study is funded by the Charles Hood Foundation Pediatric Research Grant.
In 2018, the lab wrote and submitted several journal articles that are currently under review. Published papers include the results of two lab projects and findings from Dr. Levac’s collaborations with labs in the US and Canada.

**PUBLICATIONS**


Levac D¹, Pradhan S, Fox E, Espy D & Deutsch J. (2018) Usability of the ‘Kinect-ing’ with Clinicians website: A knowledge translation resource supporting decisions about active video game use in rehabilitation. Games for Health Journal.DOI: 10.1089/g4h.2017.0159


**Conferences and Travel**

Dr. Levac was involved in two presentations at national & international conferences:


This work won the Best Paper Award at this conference!

Dr. Levac had a great visit with research colleagues at the Zurich University of Applied Sciences, Balgrist University Hospital, the Rehabilitation Center of the University Children’s Hospital of Zurich, and the Technical University of Munich!

We look forward to future collaborations with these institutions!
We had a great time hosting BPS Ellis Mendell 5th Graders and students from NU’s summer STEM program! Thank you all for you insightful questions and comments. We are always open to elementary and middle school visits. If your school or community organization is interested in a field trip, please get in touch!

The lab took part in the Museum’s Tech Kitchen Initiative on four occasions over the summer and fall, bringing our equipment to the Museum for children and families to learn about virtual reality and its role in rehabilitation. Children tested out our equipment and games, which helped us tremendously! We also participated in the museum’s Adaptive Play event, alongside Northeastern University’s Enabling Engineering team.


Dr. Levac and lab research intern Johanna Dolleans were grateful to have the opportunity to learn from colleagues at Columbia University during a summer trip to NYC. We learned a great deal from testing out the methods for one of our upcoming studies with some of the wonderful children with CP attending the Center’s day camp. Thank you!
Emily Chicklis, a recent graduate from Simmons College (soon to be Simmons University) with degrees in Biostatistics and Psychology, is the lab’s new research coordinator. Her primary focuses are participant recruitment and data analysis, and she is excited to be taking on this new role!

Christina Grassie is a third year Behavioral Neuroscience Major at Northeastern who is completing a co-op placement in the lab, January – July 2019. She will be helping with participant recruitment, data analysis, and setting up a new Bouvé Child Health Labs Collaboration.

Welcome Emily!

Welcome Christina!

Thank you Johanna – MSc Intern in Mechanical and Bioengineering, Paris, France

Johanna Dolleans is a 5th year student in Engineering for Healthcare at the University Pierre and Marie Curie in Paris, France, who completed a six month internship in the lab in 2018. She programmed and constructed virtual and physical environment tasks, assisted with the throwing study, and restructured the FITBoard.

Current ReGame-VR Lab Students

Christina Grassie
Connor Bouman
Todd Roberts
Winston Ge
Immanual Ampomah
Jessica Chu
Alexandra Cipolla
Kelly Wu
Amy Drazek
Jane Pardo
Kate Thomas
Murray Sandmeyer is a fourth year Computer Science and Musical Composition and Technology Major at Northeastern who completed a co-op placement in the lab, January – July 2018. He programmed virtual environments in Unity 3D and d-flow.

Connor Bouman is a fourth year Electrical Engineering Major at Northeastern who completed a co-op placement in the lab, January – July 2018. He worked on preparing software and electrical hardware for the lab’s physical environment transfer tasks.

We look forward to welcoming PhD students through NU’s new PhD in Human Movement and Rehabilitation Science in the fall of 2019!

The lab is always looking for students interested in involvement in directed studies, research assistantships, work–study or volunteer roles!

Families and clinicians: we would love to hear from you! We will continue to email you the published results of the studies you took part in – thank you for all of your time and efforts!

Get in touch!

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Phone: (617) 373–6107
Facebook: www.facebook.com/regamevrlab/
Twitter: @regamevr
Instagram: @regamevr

We look forward to a productive and collaborative year ahead in 2019!