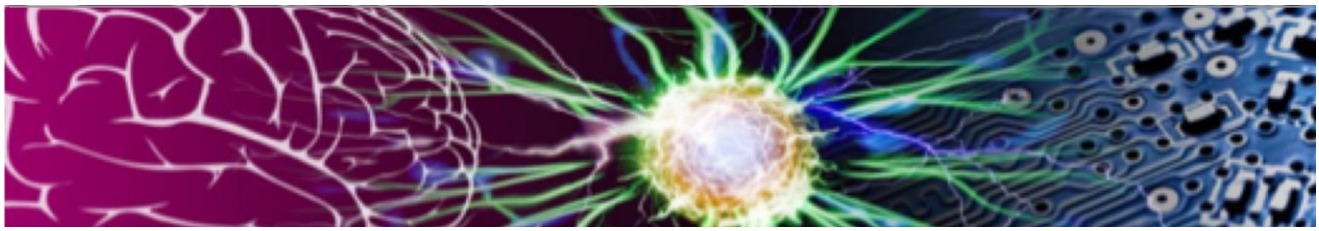
INSTITUTE OF COGNITIVE SCIENCE

Newsletter | Spring Edition | 2020



RESEARCH-IN-DEPTH: D'MELLO LAB

Sidney D'Mello sees a future workplace that is embedded in technology where teamwork – already increasingly critical – will itself be redefined. He states: "Teams will need to develop better skills in handling complex problems as routine work will be increasingly delegated to artificial intelligence (AI) technologies such as personal digital assistants. Teams will need to rapidly adapt to fluid membership and changing work structures with the growing gig economy, with crises such as COVID-19, and as new workers enter the workforce bringing new cultural practices. Individuals will need to be able to perform effectively in hetero-geneous teams as the workforce becomes more diverse and as globalization increases. The future of teamwork will require integration of technological advances to facilitate team performance, yet we are largely relying on tools and techniques from the 20th century for team facilitation. "

To address the imminent needs of the future, Sidney's group is developing ways to understand collaborative problem solving and other forms of teamwork by considering how social, emotional, and cognitive components work together. For example, one project aims to develop a theoretical "framework to assess and identify collaborative problem-solving (CPS) skills in computer-based educational environments" whereas another aims to develop an intelligent (AI-based) team facilitator to improve team performance. Through these explorations, Sidney hopes to "contribute to a new understanding on how 21st century teams can manage complexity, how team heterogeneity can lead to team effectiveness, and identify successful strategies for team adaptability.".

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IN THIS ISSUE

Digital newsletters with active hyperlinks are found at www.colorado.edu/ics/AboutUs

FROM THE DIRECTOR

Friends, never in a million years would I have anticipated that the main topic of my spring 2020 Director's letter would be the "reopening" of our CINC research facility. But, given the strange times we are living in, this is where we are at, and **I am thrilled to announce that we are back in business,** albeit in a very limited way.

As we re-open, we are building on CU's recently released Returning to Research and Creative Work Guidance, which outlines policies and safety procedures for four different levels of re-opening, as well as details on how to apply for approval from our Vice Chancellor of Research to "return".

On March 19th, we entered Phase 0 where only essential personnel could enter campus facilities to perform critical functions. We are now going into **Phase 1, whereby essential research which cannot be performed remotely is able to resume**. **Those that can work remotely need to continue to do so.** I want to thank the members of our community which contributed to the drafting of this Guidance - Dr. Nicole Speer and Prof. Cinnamon Bidwell - as this was a huge effort, and hugely important, as it paved the way for our re-opening.

Specifically, the CU plan enables human subjects research to resume, as long as it can be safely performed. This is a critical clause for ICS, as **the majority of our activities that cannot be performed remotely are human subjects studies** involving special equipment or procedures (e.g., fMRI, EEG, fNIRs) and/or the collection and analysis of biological samples.

I am really proud of the way our community came together to develop and refine our CINC reopening plan: an innovative plan that is specifically designed to enable our colleagues whose research is deeply impacted by this pandemic to quickly restart in a way that is both safe and scalable.

The centerpiece of our plan is **the division of CINC into a number of non-interacting zones,** with different groups of investigators occupying each zone. The zones are designed to minimize interactions between people in CINC, and therefore to minimize potential virus transmission, a central goal of the CU Phase 1 plan.

These zones also enable our teams to spread out, and make use of rooms not normally available to them. This is critical for multiple safety reasons: it enables more social distancing, it allows time for air to refresh if we can leave rooms "fallow" between participants (we all know how awful the ventilation in the CINC building is), and it enables teams to handle more participants without exceeding the university's stringent "density guidelines" for Phase 1. These guidelines state that the amount of people in campus facilities cannot exceed between 10 - 25% at any time in Phase 1.

I really appreciate the flexibility of our CINC residents in supporting this plan and the heroic efforts of our staff (Alan Dale and Tracey Parnaby) and Building Manager (Austin Royce Hudmon) to quickly reconfigure CINC to support these new arrangements and to stock our zones with safety and disinfecting supplies.

Before writing this letter, I reread my letter from last fall, which gleefully looked forward to a sensational 2020 that included multiple faculty searches, new funding for pilot studies, and other exciting things to take our research to new levels. Instead we are busy reopening, which may seem like a return to the very basics. But, as always, I am incredibly heartened by the creativity and dedication that you all have brought to this not-so-basic task and I remain confident in our ability to pull through this period together.

Cheers, Tammy Sumner, Director Institute of Cognitive Science

D'MELLO LAB cont.

In pursuit of these goals, Sidney is currently involved in three projects: 1) a National Science Foundation (NSF) study focuses on discovering how interpersonal interactions arise and influence collaborative problem solving in digital STEM learning environments. The aim is to make CPS more enjoyable, engaging, and effective within newly designed next-generation STEM learning environments; 2) a related project sponsored by the Department of Education's Institute of Education Sciences (IES) focuses on developing and testing a "computational model that can enable automated detection of evidence of collaboration from data captured during collaborations; and 3) a more recent study sponsored by the NSF utilizes sensor technologies for tracking team behavior in real-world workplaces, developing models of team work, and developing, testing, and refining an AI-based team facilitator tool.

ICS interviewed Sidney for details on why he became involved in this work, details of each project, and implications for future work.

Read the complete article on the ICS website.

ICS FACULTY SPECIAL MENTIONS

Congratulations to **Marie Banich** for an $11 million, 7-year National Institutes of Health (NIH) grant renewal to support the continuation of the Adolescent Brain Cognitive Development study's Boulder project site. Marie states "the next phase of the study is really exciting, because now that we have the baseline data on these kids, we can see what changes occur during the chaos of the teenage years." and " To be part of a study where 150 major researchers at 21 institutions are all rowing in the same direction is truly an amazing scientific experience." CU Boulder Today

Congratulations to **Sidney D'Mello** for 'Best Full Paper Award' from International Conference on Learning Analytics & Knowledge (LAK). Vrzakova, H., Amon, M. J., Stewart, A., Duran, N., & D'Mello, S. K. (2020). Focused or Stuck Together: Multimodal Patterns Reveal Triads' Performance in Collaborative Problem Solving.

The 2nd edition of **Jim Martin** and Daniel Jurafsky's book 'Speech and Language Processing' on Natural Language Processing were rated highly in Analytics Insight and Tableau. Available in hardcopy and digital, supported by web-content, Analytics Insight states the book is "One of the most widely referenced and recommended NLP books, written by Stanford University professor Dan Jurafsky and University of Colorado professor James Martin, provides a deep-dive guide on the subject of language processing. It is intended to accompany undergraduate or advanced graduate courses in Natural Language Processing or Computational Linguistics. However, it's a must-read for anyone diving into the theory and application of language processing as they grow and strengthen their analytics capabilities." Dan Jurafsky is a past member of ICS. Congratulations!

PUBLICATION HIGHLIGHTS

A.R. Allen, A. Raza, D. Watkins, W. R. Penuel. 2020. Measuring and Supporting Student Experiences in Biology Classrooms: Design Tensions in Assessing Interest and Identity Dimensions of Science Learning. Annual Meeting of the American Educational Research Association, San Francisco, CA

Ellingson, J., Bidwell, L.C., Hopfer, C., Hutchison, K.E., Bryan A.D. (2019). Correlates and potential confounds of cannabis withdrawal among high-risk adolescents. Journal of Studies of Alcohol and Drugs 80(5), 557-562.

J. Cho and E. Rader. "The Role of Conversational Grounding in Supporting Symbiosis Between People and Digital Assistants" Proc. ACM Hum.-Comput. Interact.. Vol. 4 No. CSCW1 Article 33 (May 2020). 2020. DOI: https://doi.org/10.1145/3392838.

Yan, D., Rupp., A. C. & Foltz, P. W. D'Mello, S. (Eds.) (2020). Handbook of Automated Assessment: Theory into practice. Taylor & Francis, CRC Press.

Vrzakova, H., Amon, M. J., Stewart, A., Duran, N., & D'Mello, S. K. (2020). Focused or Stuck Together: Multimodal Patterns Reveal Triads' Performance in Collaborative Problem Solving. Proceedings of the International Conference on Learning Analytics & Knowledge (LAK).

Forrin, N., Mills, C., D'Mello, S. K., Seli P., Risko, E., & Smilek D. (in press). TL;DR: Longer sections of text increase rates of unintentional mind-wandering. The Journal of Experimental Education. (IF = 2.92).

Spann, C., Yu, A., Galla, B., Duckworth, A., & D'Mello, S. K. (in press). Is Academic Diligence Domain-Specific or Domain-General? An Investigation of the Math, Verbal, and Spatial Academic Diligence Tasks with Middle Schoolers. Learning & Individual Differences. (IF = 1.81).

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Institute of Cognitive Science
UNIVERSITY OF COLORADO BOULDER

ICS FELLOWS & AFFILIATES SPECIAL MENTIONS

D'Mello Lab PRA, **Kaitlin Bainbridge** was interviewed for Medium.com on how the dangers of 'screen-time' are overblowm.

Congratulations to **June Gruber**, Assistant Professor of Psychology and Neuroscience who received the 2020 UROP Outstanding Faculty Mentor Award which recognizes CU Boulder faculty members for their role mentoring current undergraduates working on research, scholarly and creative projects in any major. CU Boulder Today featured her article on '6-questions: Navigating life as a working mom in a pandemic'. June was also selected to participate in the Beyond the Ivory Tower Writing Workshop at Northeastern University.

Alice F. Healy Professor Emerita and College Professor of Distinction was featured in Forbes magazine article from April 10, 2020: Does Military Training Help Healthcare Workers Facing The Coronavirus Pandemic? Three Veterans Weigh In, providing expertise in her research on translatability of training.

Brian Keegan, Assistant Professor of Information Science and working with CU Reach center, is serving a two-year term on the City of Boulder Cannabis Licensing and Advisory Board. Brian accepted this role because "There's an enormous amount of policy around zoning/licensing, law enforcement, and health/environmental safety still to be explored in this new industry. I want to bring data and a strong empirical lens to use data and scientific findings to guide policymaking."

Two press releases, one through CU and another through Eurekalert featured Assistant Professor of Applied Mathematics' **Zach Kilpatrick's** collaborative work on evidence accumulation on social networks.

Congratulations **Martha Palmer** Professor of Distinction, Linguistics and Commputer Science, for being named a 2020 Association for the Advancement of Artificial Intelligence Fellow 2020. Each year the recognizes a group of individuals who have made significant, sustained contributions to the field of artificial intelligence through the continuation of its Fellows program.

Teresa Sanders, Research Affiliate to ICS and lead in the Sanders Lab at Molecular, Celluar & Developmental Biology, was recently promoted to Senior Member in the the Institute of Electrical and Electronics Engineers, a professional association for electronic engineering and electrical engineering.

PETER FOLTZ & ALTMETRICS

With the latest coverage Medscape, ICS Research Faculty **Peter Foltz** and graduate student Chelsea Chandler's research paper on AI in psychiatry has garnered an attention score in the 99.5th percentile of published papers in Altmetrics. Also his work was featured in Time Magazine. Congratulations!

ICS PRESENTATION HIGHLIGHTS

Gendreau Chakarov, A., **Biddy, Q.**, Runberg, D. (March 2020 - canceled due to COVID19). Using Sensor Technologies to Introduce Secondary Education Students to Computational Thinking and Computer Science. Research Presentation at SIGCSE, Technical Symposium: A Vision for the Next 50 Years. Portland, OR: SIGCSE.

Michaelis, L. Invited speaker, Beyond Time 2. "What is the Event Elaboration Constraint?" University of Antwerp. February 2020.

WELCOME NEW ICS FELLOW!

Robin Burke
Professor, Department Chair Department of Information Science

Robin research in personalized recommender systems, a field he helped found and develop. His most recent projects explore fairness, accountability and transparency in recommendation through the integration of objectives from diverse stakeholders. Welcome to ICS!

GRATITUDE TO OUR ICS COMMUNITY & LEADERSHIP

Many thanks to our Director Tammy Sumner for all of her communication to faculty, fellows, staff, and students to keep us up to date as the pandemic crisis began and developed, and for setting the precedence of interacting with our teams with understanding and patience as we work in a crisis situation.

Thank you Associate Director Donna Caccamise for co-coordinating ICS closures, access, re-opening, organizing and managing ICS staff for off-site work, directing the management of Muenzinger and CINC offices and facilities, and painstakingly conducting budget exercises required by CU senior management to meet campus budget shortfalls.

Thank you Cinnamon Bidwell, Nicole Speer, and Tammy Sumner for representing ICS on the CU Research Facility Working Group to move toward safe restart of critical research operations.

Nicole, Tammy and other CINC users have been meticulously creating a comprehensive safety plan for the CINC building to restart scanning operations for research data collection. Thank you!

And a big shoutout to our Muenzinger and CINC ICS staff for keeping our building spaces safe, grabbing mail and deliveries, keeping the plants alive, seamlessly running business as usual despite the challenges of working from homes, and completing the enormous task of preparing CINC for essential research operations. Special kudos to Alan and Tracey who took on the bulk of this site-work!

PUBLICATION HIGHLIGHTS cont.

D'Mello, S. K., Southwell, R. & Gregg., J. (in press). Machine-Learned Computational Models can Enhance the Study of Text & Discourse: A Case Study Using Eye Tracking to Model Reading Comprehension. Discourse Processes. (IF = 1.58).

Faber, M., Krasich, K., Bixler, R., Brockmole, R. & D'Mello, S. K. (in press). The Eye-Mind Wandering Link: Identifying Gaze Indices of Mind Wandering Across Tasks. Journal of Experimental Psychology: Human Perception and Performance. (IF = 2.98).

Gardner, M., Hutt, S., Kamentz, D. Duckworth, A., L., & D'Mello, S. K. (in press). How does high school extracurricular participation predict bachelor's degree attainment? It's complicated. Journal of Research on Adolescence. (IF = 2.07).

Stewart, A., Amon, M. J., Duran, N., & D'Mello, S. K. (2020). Beyond Team Makeup: Diversity in Teams Predicts Valued Outcomes in Computer-Mediated Collaborations. Proceedings of the ACM CHI Conference on Human Factors in Computing Systems (CHI 2020).

Jensen, E., Dale, M., Donnelly, P., Stone, C., Kelly, S., Godley, A., & D'Mello, S. K. (2020). Toward Automated Feedback on Teacher Discourse to Enhance Teacher Learning. Proceedings of the ACM CHI Conference on Human Factors in Computing Systems (CHI 2020).

Vrzakova, H., Amon, M. J., Stewart, A., Duran, N., & D'Mello, S. K. (2020). Focused or Stuck Together: Multimodal Patterns Reveal Triads' Performance in Collaborative Problem Solving. Proceedings of the International Conference on Learning Analytics & Knowledge (LAK).

M. Schneider, C. Hill, M. Gross, A. Eisenberg and A. Blum. "A Software Debugger for E-textiles and Arduino Microcontrollers." Proceedings of FabLearn 2020. 2020 (Postponed)

Yan, D., Rupp., A. C. & Foltz, P. W. (Eds.) (2020). Handbook of Automated Assessment: Theory into practice. Taylor & Francis, CRC Press.

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CU REACH CENTER UPDATE

From a podcast titled 'Cannabis Science Today' to talking about Marijuana and CBD to popular magazines and providing expert commentary on alcohol vs. marijuana use, researchers at CU REACH have had a busy and productive winter and spring.

Some additional highlights were: 'Do Ketamine and CDB Help with Stress?' in Outside magazine; 'A New Online Course Reveals What Scientists Really Know About Marijuana's Health Benefits' in 5280 Magazine; and 'Stressed? Try Rewarding Yourself Eating Fruits and Veggies' in Colorado Arts and Sciences Magazine.

Congratulations to Kent Hutchison and Angela Bryan's graduate student Sarah Hagerty, who received the Dosier Muenzinger Award for Outstanding Contribution to Translational Research.

Congratulations to Biomarker Lab team member, undergraduate Ethan Taylor for his Summer BSI Research Award.

Congratulations to Hollis Karoly, who will be joining the faculty of the Department of Psychology at CSU as a tenure-track Assistant Professor this fall. She will have a dual appointment in the Cognitive Neuroscience and Counseling Psychology areas. She will continue her affiliation with researchers at ICS.

RESEARCH & LIFE AMIDST A PANDEMIC

An Interview with CU Reach Laboratory Manager Renee Martin-Willett

ICS: What challenges have you and the center faced since early March?

RM: A unique challenge is that all of our Professional Research Assistants spend around 40% of their time in the mobile lab screening and running participants, traveling to collect data in the community every day, which is impossible with the pandemic. Getting shut down and having so much uncertainty around work tasks was probably traumatic for many people on the team.

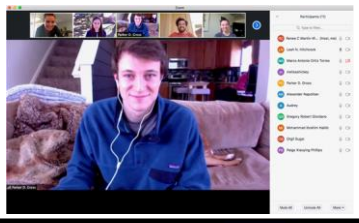
ICS: How do you mitigate for these changes?

RM: To minimize the trauma, we check in with one another frequently and make a point to express gratitude so each team member knows they remain an important part of the team, even though they may not be able to do a core part of their jobs. We continue with all our standing meetings, different levels of interactions that we typically have but holding them virtually. We also hold virtual Happy Hours. Everybody wants to work. Everyone wants to feel like a part of this team, so taking the time to find tasks for people to do, even though it's not part of their primary role is a focus of my job during these times. We all focus on making sure everyone knows they are valued and important.

CONNECTING WITH COLLEAGUES & TEAMS

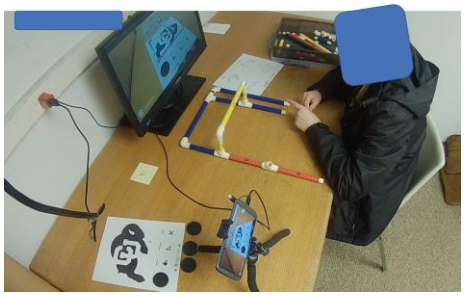
CU REACH & CU Change

Continuing their 'Happy Hour' tradition online, and use breakout rooms on Zoom.



CENTER FOR RESEARCH ON TRAINING UPDATE

One of main current projects in the Center is our study of human planning and spatial reasoning in construction settings using augmented reality, a collaboration between Paul Goodum and Matt Hallowell in Civil Engineering, Tom Yeh in Computer Science, and Matt Jones in Psychology. We were fortunate to collect a large set of data on a laboratory construction task during the winter, so there has been plenty of work to do remotely, coding video recordings from the experiment and analyzing the data. We are also designing more elaborate materials for the next round of studies to begin in the fall.



PUBLICATION HIGHLIGHTS cont.

Chandler, C, Foltz, P. W., & Elvevåg, B. (2020). Using Machine Learning in Psychiatry: The Need to Establish a Framework that Nurtures Trustworthiness. Schizophrenia Bulletin, 46(1), 11-14.

Cohen, A.S., Cox, C., Tucker, R., Mitchell, K.R., Schwartz, E.K., Le, T., Foltz, P.W., Holmlund, T.B. & Elvevåg, B. (2020). Validating digital phenotyping technologies for clinical use: the critical importance of "resolution". World Psychiatry, 19(1), 114-115.

Foltz, P. W. (2020). Practical Considerations for Using AI models in Automated Scoring of Writing. In H. Jiao & R. W. Lissitz (Eds.). Applications of Artificial Intelligence to Assessment. Charlotte, NC: Information Age Publisher.

Foltz, P. W. Yan, D., & Rupp, A. C., (2020). The Past, Present, and Future of Automated Scoring for Complex Tasks. In D. Yan, A. C. Rupp, & P. W. Foltz (Eds.). Handbook of Automated Assessment: Theory into practice. Taylor & Francis, CRC Press.

Holmlund, T.B., Chandler, C., Foltz, P.W. Cohen, A. S., Cheng, J., Bernstein, J., Rosenfeld, E., & Elvevåg, B. (2020). Applying speech technologies to assess verbal memory in patients with serious mental illness. NPJ Digital Medicine. 3, 33. https://doi.org/10.1038/s41746-020-0241-7

Rupp, A. C., Yan, D., & Foltz, P. W. (2020). Automated Scoring in Practice In D. Yan, A. C. Rupp & P. W. Foltz (Eds.). Handbook of Automated Assessment: Theory into practice. Taylor & Francis, CRC Press.

Yan, D., Rupp., A. C. & Foltz, P. W. (Eds.) (2020). Handbook of Automated Assessment: Theory into practice. Taylor & Francis, CRC Press.

J. Gruber & J. Joormann. (2020). Best practices in research in clinical science: Reflections on the status quo and charting a path forward. Journal of Abnormal Psychology, 129(1), 1-4. https://dx.doi.org/10.1037/abn0000497

J. Gruber, J.L. Borelli, M.J. Prinstein, L.A. Clark, J. Davila, D.G. Gee, D.N. Klein, R.W. Levenson, J. Mendle, B. Olatunji, G.L. Rose, D. Saxbe & L.M. Weinstock, (2020). Best practices in research mentoring in clinical science. Journal of Abnormal Psychology, 129(1), 70-81. https://doi.org/10.1037/abn0000478

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INTERMOUNTAIN NEUROIMAGING CONSORTIUM

After a strong start to the new year and a busy winter, our community was taken by surprise by the speed with which campus research operations came to a screeching halt in mid-March. INC leadership had been discussing contingency plans for what to do in the case of a local coronavirus outbreak, and not a week later we were closing our doors without knowing when we would be able to resume scanning operations.

The first two weeks of the closure were focused on adjustment: adjusting to campus closures, stay-at-home orders, new routines, remote meetings, childcare, self-care, and the sudden loss of our day-to-day community. Once the dust settled, we moved on to pivoting our priorities and work for a prolonged period without data collection. Our team had spent January and February understanding our values, mission, and vision, which helped us quickly transition our work and use the first month of our shutdown to make progress on mission-critical projects such as:

- Creating databases of every prior scan session and study in INC's almost 9-year history to track trends in our use and monitor for potential problems
- Designing and testing a new architecture for MRI data and analysis storage on PetaLibrary, our Research Computing-based storage system
- Archiving and deleting old data from our 575TB storage space on PetaLibrary
- Fully automating our new user onboarding process, which gives users to our facility training for and access to our computing and other equipment resources
- Writing a document to educate our users about the different types of scans we can acquire at the INC
- Setting up real-time motion tracking software (FIRMM) for studies to assess participant movement and data quality during scan sessions

We also initiated a weekly virtual community hour on Friday afternoons to bring people together, and daily virtual check-ins and weekly meetings with our staff to maintain our team focus and support each other while we are physically distanced.

In mid-April, we switched our focus to preparation in anticipation of being able to reopen in a limited capacity this summer. In addition to working with groups across campus and ICS to draft University-wide and Institute-specific policies for restarting research, we drafted detailed protocols for safety and cleaning policies at INC, secured PPE and other needed supplies, began training our INC interns to assist study teams with data collection, created a scheduling optimization algorithm to help studies make up for lost data collection time when we reopen, and logged 25 meetings with over a dozen study teams to get feedback on our evolving reopening procedures and ensure we can scan participants in a safe, efficient, and cost-effective manner.

While this pandemic has created unprecedented challenges for our facility and neuroimaging community, it has also allowed our community's strengths in problem-solving, creativity, and teamwork to shine. We have a lot of work to do as we restart our scanning operations in the context of a global pandemic, and we know we are only at the start of a marathon. While this was not the start of the year we envisioned, and we don't yet have a clear picture of the coming months, we are a resilient and resourceful community. We are confident our dedicated and determined staff and our collaborative and open-minded research community will enable us to use this time of crisis to strengthen and innovate our data acquisition and analysis operations.

To that end, we would like to extend a giant THANK YOU to the many research teams who are helping us solidify our reopening plans and working with us to create a safe and effective environment for conducting human MRI research in a highly unusual context. Our ability to innovate and adapt in response to this crisis would not be possible without the support and feedback of the research teams that use our facility. We are very grateful for our incredible partners in the INC community.

inquiryHUB UPDATE

inquiryHub continues the improvement of the high school biology curriculum through research-practice partnerships with educators. In addition, a new high school chemistry curriculum is in the midst of development and testing.

SchoolWideLabs (SWL) is a project currently housed under inquiryHub and the Sumner Lab. SWL participated in the 2020 STEM for All Video Showcase. The Video Showcase is an annual, online event that features short videos that introduce the public to a wide variety of federally funded research projects. The showcase ran from May 5-12, 2020 but all the videos - as well as the discussions they generated - are still available for viewing.

The SWL team recently secured funding from the James S. McDonnell Foundation to continue our research on integrating computational thinking into middle school science classrooms. This new funding will enable the CU research team to continue its partnership with Denver Public Schools -- including using curricular materials developed by the team in more schools throughout the district, and collecting data on how teachers learn to support computationally rich discourse in their classrooms. In addition, the team will continue to partner with researchers at Utah State University and begin work with a cohort of teachers from Cache County, Utah to study how learning is affected by various school and district contexts.

DISSEMINATION ACTIVITIES

End of Year Townhall and Poster Session Held Virtually in April 2020!

Celebrating our researcher and student efforts and coming together in community was more important than ever in these unusual and stressful times of the start of the COVID-19 pandemic. Though we all missed the enormous taco bar that Jean and team organize for us annually, several people presented during the townhall and many people attended.

73 people participated via Zoom and that was better than our wildest imagination! Thank you all for participating and making it possible. We received several heartwarming comments, and overall people seemed to really appreciate that ICS is trying to bring the community together and to keep everyone connected and informed.

We are particularly glad to see both Walter Kintsch (our founding Director) and Eileen Kintsch (ICS Research Associate) dialed in?

We also appreciated all the presenters and visitors to our first Virtual Fiesta Poster Session event. 24 posters were submitted, with most of the researchers available to talk about their posters via simultaneous live Zoom rooms. Visitors popped in and out of several poster rooms, speaking with the presenters.

The posters are available for viewing on our website and remain there as an archive. https://www.colorado.edu/ics/research/virtual-poster-session-2020 and you may contact the authors through email to ask questions and provide comments.

We would like to thank ICS Fellow from Computer Science, Rafael Frongillo, and Jean Bowen for the idea to hold a virtual poster session.

DISSEMINATION ACTIVITIES cont.

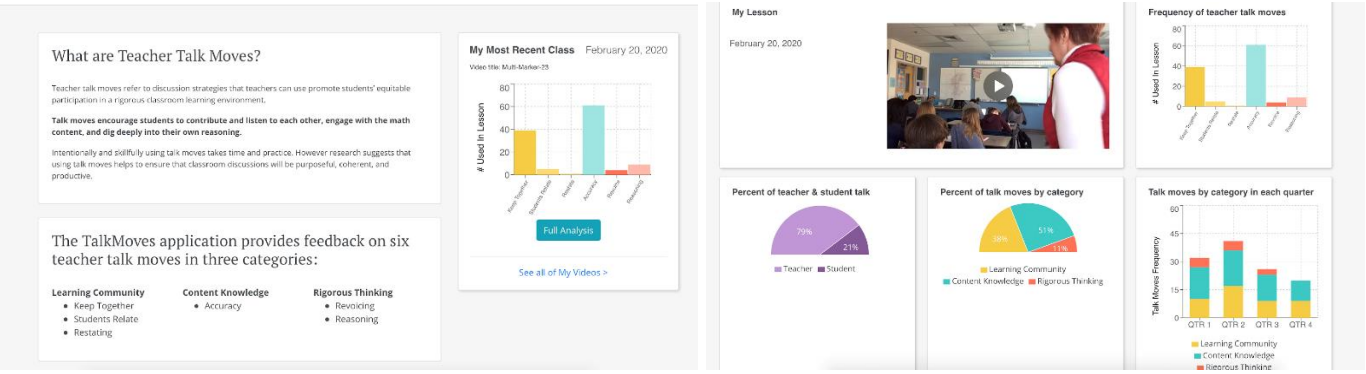
Remote Learning Resource for the Larger Educational Community, Including Higher Education

Bill Penuel and colleagues have developed a new tool to help educators and administrators think through the transition to remote teaching and learning.

The tool, titled Remote Learning Resource: Setting Norms was developed primarily for the use by K-12 science teachers with the objective to 'humanizing remote learning', it offers relevant content for use in higher education.

ICS Director Tammy Sumner noted: “This tool encourages all of us to recognize that these are not normal times, and that now our classroom cultures - more than ever - need to emphasize pedagogical practices that support community, belonging, and human feelings. I encourage both faculty and students to review this remarkable tool and think about how your own behavior can contribute towards humanizing our remote learning experiences and supporting each other to be successful in our coursework this semester. “

AI IN EDUCATION: TalkBack PROJECT



The TalkBack project, funded by an NSF BigData grant, has developed a web application that was piloted by a group of 21 teachers from Adams 12 and Boulder Valley school districts this past year. The project team (which includes Tammy Sumner, Jim Martin, Jennifer Jacobs, Chenhao Tan, Wayne Ward, Abhijit Suresh, Vivian Lai, and Karla Scornavacco) represents a mix of CU faculty and students with backgrounds in computer science, natural language processing, and education.

The web application provides individualized feedback to teachers about their discourse patterns during math lessons. Teachers film their own lessons using a SWIVL robot, and the resulting audio track is run through multi-layer processing pipeline. The processing pipeline generates an automated lesson transcript that identifies teacher and student speech and includes deep learning models to detect the use of specific “talk moves” made by teachers and students.

Teachers can access the application to review their feedback for a given lesson or their feedback across multiple lessons. The application is intended to help teachers learn about talk moves and motivate them to use more productive discourse patterns aligned with the educational research literature on best practices. Above are views of the current dashboard and feedback for a single lesson. By Fall 2020 the application will be updated to include more features and design improvements. At the moment access to the site is password-protected; however, the research team would be happy to share additional information with anyone who is interested. Please email us for more information.

ICS CERTIFICATES AND PHD COMPLETION

Congratulations!

Triple PhD

Jason Zietz
Computer Science, Neuroscience & Cognitive Science

Combined PhD

Alexandra Gendreau-Chakarov
Computer Science and Cognitive Science

Leighanna Hinojosa
Learning Sciences and Human Development (School of Education) and Cognitive Science

Graduate Certificate in Cognitive Science

Isabella Huang
Computer Science

Ziying Zhang
Computer Science

Human Language Technology Certificate

Princess Dickens
Linguistics

Liu Ling
Linguistics

ICS Undergraduate Certificate in Cognitive Science

Caroline Aemmer
Speech, Language, Hearing, Sciences

Kieran Britt
Linguistics

Marlee Joon Lederer
Psychology

Arthur Pellegrino
Neuroscience

Chloe Tucker
Psychology

Congratulations to **Alexandra (Alex) Gendreau Chakarov** who successfully defended her combined Ph.D. in Cognitive Science and Computer Science. She will graduate in the summer. Her dissertation was titled: "Integrating Computational Thinking into Middle Science Curriculum Using Programmable Sensor Technologies."

Alex's committee included ICS Director Tamara Sumner (chair), ICS Fellow Benjamin Shapiro, Eliana Colunga, and Clayton Lewis, as well as ICS Faculty William Penuel.

Congratulations to **Leighanna Hinojosa**, who graduated this term with her combined Ph.D. in Learning Sciences and Human Development from the School of Education and Cognitive Science from ICS. Her dissertation was entitled "Identity Development, Participation, and Equity in Museum Community Science Programs."

Leighanna's committee members included ICS Fellow Joe Polman (chair) and ICS Faculty Bill Penuel and Tammy Sumner as well as Intermountain Neuroimaging Consortium Director Nicole Speer, along with CU Boulder faculty member Susan Jurow and UC Berkeley faculty member Kris Gutiérrez.

Congratulations to **Jason Zietz** who completed a rigorous triple Ph.D. in Cognitive Science, Computer Science, and Neuroscience. Jason has accepted and is working in an instructor faculty position with Information Sciences in the College of Media, Communications, and Information. Along with his strong interests in teaching various aspects of computing, he is interested in how computational systems can be designed to support personal and societal well-being.

STUDENTS RECOGNITIONS

Srinjita Bhaduri, who is a student of Tammy Sumner, received the Beverly Sears Graduate Student Award, congratulations!

Congratulations to **Christian Hill** who works with Ann Eisenberg, Director of the Craft Technology Lab, for his Honorable Mention for the Computing Research Association's (CRA) Outstanding Undergraduate Researcher Award for 2020.

Boman Groff was awarded a NSF Graduate Research Fellowship. Boman is a graduate student working with Marie Banich, and an ICS student member. Congratulations!

Congratulations INCtern **Rafael Orozco Leon** who received the David E. Drutz Scholarship and Bourne/Yaroush Family Scholarship undergraduate award from the department of Psychology and Neuroscience.

INCtern **Kiara Rodrigues** was awarded an undergraduate David E. Drutz Scholarship from the department of Psychology and Neuroscience. Congratulations!

Student Awards Committee

Welcome Norielle Adricula representing Linguistics, who will serve as the Student Awards Committee Chair.

Other new representatives are Layne Hubbard, Spencer Dudley, and Janghee Cho, who will be the first member from Information Science to join this committee.

Thank you to all continuing members!

- LING - Norielle.Adricula@colorado.edu(chair)
- EDU - Spencer.Dudley@colorado.edu new
- PHIL - Lisa.Thomassmith@colorado.edu continuing
- PSYC - Shannon.Mcknight@colorado.edu continuing
- SLHS - Carly.Schimmel@colorado.edu continuing
- CS - Layne.Hubbard@colorado.edu new
- INFO - Janghee.Cho@colorado.edu new

STUDENT TRAVEL & RESEARCH AWARDS

Spring 2020 Awardees

For Spring 2020 the ICS Student Travel & Research Awards Committee supported three applicants, congratulations!

Spencer Dudley (EDU)
Travel award of $500 to present a first author poster at the AERA conference.

Sarah Moeller (LING)
Travel award of $500 to help organize the Language Technology for Language Documentation & Revitalization Workshop.

Don Bell Soeder (SLHS)

Travel award of $500 to present as first author at the CUNY 2020 Human Sentence Processing Conference.

Summer and Fall Student Awards Update

Because of university travel restrictions due to the pandemic, only research awards will be issued. Funding for research can include compensation to participants, purchasing of materials, hiring of undergraduate RAs, etc. Since some conferences are moving to a remote format this summer, funds slated for travel awards will be distributed to fund attendance to remote conferences/workshops/etc. Summer awardees for presenting/attending virtual events will be announced soon. The deadline to apply was May 29.

Information on applying for a fall award will be available mid-summer. If the travel restrictions are lifted in the summer or early Fall 2020, then the Fall award cycle will be opened earlier to try and accommodate travel in the fall.

Details on the application process is found at ICS website Student Travel & Research Awards page.

Continued on page 13…

STUDENT TRAVEL & RESEARCH AWARDS cont.

The current Student Travel & Research Awards committee and the students, faculty, and leadership at ICS would like to thank the following outgoing committee members for their service to the community.

Stephen Sommer, School of Education for serving as Chair.

Alexandra Gendreau Chakarov for representing Computer Science.

COOL STUFF BY STUDENTS

As part of her dissertation, Srinjita Bhaduri who is an ICS PhD Student, is partnering with Denver Public Schools STEM and technology teachers to implement a 3D printing curriculum called Teach3D in middle school classrooms. The curriculum is centered around introducing effective ways to teach 3D printing using a student-centered curriculum on providing support to animals with disabilities.

Students participating in this curriculum are tasked with designing a 3D printed solution to support animals with deformities. Students conduct a variety of engineering investigations that are rooted in students reflecting on the need to learn 3D modeling using Computer-Aided Design (CAD) tools. As such, students are understanding the need to learn 3D modeling and 3D printing, and in turn, enhances their spatial thinking skills by engaging in rich 3D manipulations of shapes. Srinjita plans on continuing this partnership and extending the curriculum to support other social needs for 3D printing.

Below: students working on creating 3D prints for the animals (plush toys as seen in the picture).

ICS STUDENT PUBLICATION & PRESENTATION HIGHLIGHTS

S. Bhaduri, P. Gyory, and T. Sumner. 2020. 3DARVisualizer: Debugging 3D models using Augmented Reality. Demo accepted for FabLearn Flagship conference NYC 2020.

Gendreau Chakarov, A., Biddy, Q., Runberg, D. (March 2020 - canceled due to COVID19). Using Sensor Technologies to Introduce Secondary Education Students to Computational Thinking and Computer Science. Research Presentation at SIGCSE, Technical Symposium: A Vision for the Next 50 Years. Portland, OR: SIGCSE.

A. Raza, W. R. Penuel, J. Jacobs, T. Sumner. 2020. Scaffolding Teachers Sense Making for Classroom Equity using Visual Analytics. Poster presented at Tenth International Learning Analytics & Knowledge Conference (LAK'20)

A.R. Allen, A. Raza, D. Watkins, W. R. Penuel. 2020. Measuring and Supporting Student Experiences in Biology Classrooms: Design Tensions in Assessing Interest and Identity Dimensions of Science Learning. Annual Meeting of the American Educational Research Association, San Francisco, CA

M. Schneider Pin Status: An Arduino Debugging Library for High School E-textile Courses. Proceedings of the 51st ACM Technical Symposium on Computer Science Education. 2020.

M. Schneider, C. Hill, M. Gross, A. Eisenberg and A. Blum. "A Software Debugger for E-textiles and Arduino Microcontrollers." Proceedings of FabLearn 2020. 2020 (Postponed)

S. Sommer & J. Polman Iterative Participant & Activity Structures in a Peer Supported Science Infographic Curriculum; Forthcoming in the 14th International Conference of the Learning Sciences Proceedings, July 2020

J. Polman, C.Graville, S. Sommer Data Literacy for Social Justice; How Positioning Youth as Data Journalist Affords and Constrains a Justice Orientation; Forthcoming in The 14th International Conference of the Learning Sciences Proceedings, July 2020.

Graduate Certificate and Combined PhD Program and Undergraduate Certificate Program info is found:

www.colorado.edu/ics/graduate-programs

www.colorado.edu/ics/undergraduate-certificate-cognitive-science-overview

DISSERTATION SPOTLIGHTS

Moving Automated Gaze-based Engagement Detection out of the Lab

Stephen Hutt
Advisor: Sidney D'Mello

Stephen Hutt (Dept of Computer Science) is interested in how low-cost sensors and AI techniques can be used to improve education. His research looks at methods to monitor and respond to engagement in learning, scaling up laboratory techniques to real world environments including classrooms and online learning.

His dissertation focuses on using commercial off-the-shelf eye trackers to monitor engagement as students interact with an Intelligent Tutoring System in their regular high school classrooms. He shows that when combined with machine learning techniques, data collected with low-budget sensors is of sufficient fidelity to train automated student-independent engagement detectors. These detectors are then used to deliver real time learning interventions designed to re-engage students and address the learning deficit that may have resulted from lack of engagement. It is his hope that this work can help move eye tracking research away from one person at a time in a laboratory and into classrooms, in other words, out of the 'fr-eye-ing' pan and into the fire!

Stephen would like to thank his advisor, Sidney D'Mello and committee members Donna Caccamise, Jim Martin, Clayton Lewis and Alessandro Roncone, as well as fellow lab members and the departmental support staff, Alan Dale, Cat Latzer, Ellen Mackenzie, and Rajshree Shrestha for their support and guidance. Stephen intends to graduate in July 2020 with a PhD in Computer Science.

In Support for Remote Collaborative Problem Solving

Angela Stewart
Advisor: Sidney D'Mello

Angela Stewart (Dept of Computer Science) Collaborative problem solving (CPS) in virtual environments is considered an important 21st century skill, as teams are increasingly distributed, either by choice, for logistical reasons, or more recently due to government order. However, as many of us have experienced, teams often do not perform as well as they theoretically could. Angela's dissertation work explores methods of solving this problem through automated feedback that attempts to improve CPS in STEM tasks.

First, two to three teammates engage in a short collaboration session, and their speech from that session is recorded and automatically transcribed. The language derived from the automated transcription is fed into machine learning models, which provide predictions of how well an individual engaged in three key CPS facets: shared construction of knowledge, negotiation, and coordination, and maintaining positive team function. A score for each of the CPS facets is derived from these predictions. These scores, along with recommendations for how to improve the scores, are communicated to teammates. Equipped with this new information, the teammates collaborate again. The team engages in this feedback loop for multiple rounds, with goal of improving their CPS scores.

Angela would like to thank her advisor, Sidney D'Mello, committee members, Peter Foltz, Jim Martin, Nick Duran, and Chenhao Tan, fellow lab mates, and the departmental support staff, Alan Dale, Cat Latzer, Ellen Mackenzie, and Rajshree Shrestha for their time and support. Angela intends to graduate in July 2020 with a PhD in Computer Science.

Institute of Cognitive Science
UNIVERSITY OF COLORADO **BOULDER**

RESEARCH-IN-DEPTH:
Intermountain Neuroimaging Consortium

Keeping Research Moving in Extraordinary Times

Intermountain Neuroimaging Consortium's (INC) collective movements toward their goal of safely and carefully re-opening for research is inspiring. Their work represents a truly collaborative effort to adapt, shift, be consciously inclusive and understanding, and grow an even more effective team within the challenges of remote working.

ICS spoke to Nicole Speer, INC's Director of Operations on staying connected, leadership, goals, team building, professional development, and diversity and inclusion during this extraordinary time.

ICS: What are you as the Director of Operations doing to stay connected and stay in touch with your team?

NS: INC has used Slack for years as an instant messaging style communication system and having this tool in place enabled us to transition pretty easily to fully remote team communication. Early on the INC core staff (4 people: Nicole, Teryn, Lena, Denny) checked-in virtually four days a week, I met individually once each week with the core staff and INCterns (Rafael, Kiara, and Suebin), and then we had an all-INC staff meeting once each week as well as an INCtern-specific meeting once each week. We held a virtual happy hour open to the entire community weekly for a while, to maintain our sense of community. It was hard to replace the personal connecting, chatting, and regular 'hallway conversations' that occur at our facility with our research teams and. Members of my team also met with our study teams about critical data collection about restarting research, critical data collection needs, and scheduling. Between March 26 and June 10, we had 56 meetings just with study teams! Recently as we approach our June 15 date for restarting data collection, we have been having daily check-in meetings involving all our staff members.

ICS: That's a lot of meetings! How long are the meetings?

NS: (Laughing) Generally daily core team check-ins last about 30 min (20 minutes to 45 minutes long) and other meetings vary. We try to limit our remote meetings to one hour.

Continued on page 16…

PUBLICATION HIGHLIGHTS cont.

J.A. Jaggers & J. Gruber. (2020). Mixed mood states and emotion-related impulsivity in bipolar spectrum disorders: A call for greater investigation. International Journal of Bipolar Disorders, 8, 12.

A. Dodd, K.E. Gilbert & J. Gruber. (2020). Beliefs about the automaticity of positive mood regulation: Examination of the BAMR-Positive Emotion Downregulation Scale in relation to emotion regulation strategies and mood symptoms. Cognition and Emotion, 34(2), 384-392.

J. Gruber, D. Saxbe, B. Bushman, T. McNamara & Rhodes (2019). How can psychological science cultivate a healthier, happier, and more sustainable world? Perspectives on Psychological Science,14(1), 3-6.

K. Stanton, S. Khoo, D. Watson, J. Gruber, M. Zimmerman & L.M. Weinstock. (2019). Unique and transdiagnostic symptoms of hypomania/mania and unipolar depression. Clinical Psychological Science, 7(3), 471-487.

B.Q. Ford, J.J. Gross & J. Gruber. (2019). Broadening our field of view: The role of emotion polyregulation. Emotion Review, 11(3), 197-208

G.P. Strauss, F.Z. Esfahlani, K.F. Visser, J. Gruber & H, Sayama. (2019). Mathematically modeling emotion regulation abnormalities during psychotic experiences in schizophrenia. Clinical Psychological Science, 7(2), 216-233.

T. Wingenbach, B. Ribeiro, C. Nakao, J. Gruber & P.S. Boggio. (2019). Evaluations of affective stimuli modulated by another person's presence and affiliative touch. Emotion.

P.S. Boggio, A.C. Giglio, T. Wingenbach, L.M. Marques, S. Koller, & J. Gruber. (2019). Writing about gratitude increases emotion regulation efficiency. Journal of Positive Psychology.

J. Man, J. Gruber, D. Glahn & W.A. Cunningham. (2019). Altered amygdala circuits underlying valence processing among manic and depressed phases in bipolar adults. Journal of Affective Disorders. 245(15), 394-402

Continued page 23…

RESEARCH-IN-DEPTH: INC Cont.

ICS: Why all the meetings?

NS: Talking with study teams ensures all staff and study teams have a common sense of purpose and understand how best to move forward in this new landscape. With so many constraints to balance in this reopening process, it is critical we have regular input from the PIs and research teams using our facility to make sure we are implementing appropriate and realistic safety measures. The core INC staff has daily check-in meetings because the planning needed to reopen is intense. And talking frequently as a team in this constantly shifting environment helps us all stay focused, grounded, and connected, and helps us review what has happened in the previous 24 hours of time so we can assess where we are and where we need to go.

ICS: How do you keep the meetings productive?

NS: We developed a structure to the meetings where one person shares at a time and addresses: 1) how are you, generally; 2) what are you working on; 3) what are the one or two things you are focused on getting done; 4) what do you need to move forward and make progress, where are you blocked, where are your challenges in making progress?

Then as a group we dive into what came up for each person. At the end we go over information we gathered from outside the team so everyone on the team knows what is happening outside of the organization that may affect our work.

We find that talking in real-time provides a more holistic view of what is happening work wise within the team and how each member is doing, compared to individual emails and phone calls. The daily check-ins force us to distill what is most important to our goal of making up for this lost data collection time, and how to quickly adapt and change what we work on when obstacles arise. This has been so helpful that the team will likely continue this check-in even when business goes back to normal. We also developed a Wildly Important Goals (WIG) Dashboard to track our progress. See more on WIG below.

RESEARCH-IN-DEPTH: WILDLY IMPORTANT GOALS

ICS: What are 'Wildly Important Goals' (WIG)?

NS: Back in February, INC was working on identifying our team WIGs for this year, which are one or two extremely important goals that we feel matter the most to our facility. In the midst of clarifying these goals, the pandemic hit. After a few weeks of scrambling to identify what we needed to be doing to manage the shutdown and transition to working from home we regrouped and came up with WIG goals and priorities based on the changes caused by the pandemic.

Our current WIG is to make sure research teams collect 90% of the scanner data they need collect this year to stay on track with their grant and funding deadlines. That's pretty ambitious but we believe it's an achievable goal, and this goal drives much of the work we do.

One critical feature of the WIG model is identifying a couple of "leading indicators" that are likely to predict whether or not the team is on track to accomplish its WIG. Our leading indicators are hours that we have assigned to study teams on the scanner, and meetings with study teams. If we see those numbers going up each week and month, we believe that we will be on track to achieve our data collection goals by the end of the year.

ICS: What structures have you built to achieve the WIG?

NS: To make sure we are on track to achieve this goal we created a WIG Dashboard to track our progress. The Dashboard is a kind of "Scoreboard" to track our team's progress and provide insight into whether or not we are likely to achieve our WIG. The "Scoreboard" is a fun and visual tool that lets the team know when we may be at risk of missing our target, when it's still early enough to change course. I'm happy to share our WIG Dashboard with anyone interested in adopting this tool. Once a week during the core staff meeting, we review the scoreboard and each make a commitment for the week ahead: what is the one thing we each commit to doing, that will move us closer toward our goal. The main benefit is that we can be proactive in identifying problems that put our goal at risk. This method also allows each team member to contribute in their own unique way to the team goal.

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NEW GRANTS AWARDED TO ICS

From working-from-home to labs unable to collect data at CINC and out in the world, COVID-19 has presented massive challenges to our research institution. However, it is important to note that our work continues to grow, with adaptations to current data collection methods as well as with the granting of new funds for research. The following grants were received at ICS as of November 2019. It is an inspiring show of the collective efforts of our community. ICS will be a part of $18,650,483.00 in new grant funded research portioned to ICS in some percentage. This is an impressive volume of new funds for our research efforts. Congratulations to all!

PI Name (BOLD)	Sponsor	Title of Project	# of Years
BANICH Kaiser, Friedman, Corley	NIH	14/21 ABCD-USA Consortium: Research Project at CU Boulder	7
BANICH	NIH	ABCD-USA Consortium: Twin Research Project-Supplement (2nd)	1
D'MELLO	DOD	A Comprehensive Approach to Modeling Job Performance via Unobtrusive, Continuous, Multimodal Sensing	1
HUTCHISON Bidwell, Bryan	NIH	Novel Approaches to Opiate Use Reduction	0.8
KETELS Yowell, Shaheen	NSF	RET Site: Authentic Research Experiences for Teachers (ARETe): Connecting Community College Faculty and Students to University Engineering and Computer Science Labs	3
PEFFER	NSF	Enhancing Biology Education Research by Bridging Disciplinary Boundaries between Discipline-based Education Research in Biology and Learning Sciences	1
PENUEL	Gates Foundation	ACESSE - Council of Science State Supervisors	1.8
PENUEL	NCCI	Open SciEd Developers Consortium: Field Test Data Collection, Analysis, and Reporting	1
PENUEL Wingert	NSF	Preparing Teachers to Design Tasks to Support, Engage, and Assess Science Learning in Rural Schools	4
PENUEL	NSF	The Advancing Coherent and Equitable Systems of Science Education (ACESSE) Project	5
SEDEY	NIH	Universal Newborn Hearing Screening and Intervention	1
SUMNER Penuel, Biddy, Jacobs	JSMF	Developing a model of Teacher Learning to support Computationally Rich Communications in Science classrooms	5
SUMNER Biddy	NSF	Collaborative Research: DTI: STEM Career Connections: A model for preparing economically disadvantaged rural youth for the future workforce	3
YOSHINAGA-ITANO	WHO	Systematic Review of Universal Newborn Hearing Screening Outcomes for WHO	0.16

RESEARCH-IN-DEPTH: WILDLY IMPORTANT GOALS cont.

ICS: What structures have you built to achieve the WIG? (continuing reply from page 16)

As an example, Lena created an Optimization Algorithm that would create a schedule that optimized for nearly 100,000 constraints -- for example which days and times studies can run participants, how many people they need to have by a certain time, how much it will cost INC to staff extra hours and INC staff availability. The algorithm helps us balance our new safety measures, study needs and constraints, and INC staff schedules as cost-effectively and efficiently as possible. With 12 different study teams working with our scanning facility, efficiency in scheduling is critical. The calendar algorithm not only makes the scanner use more efficient, it provides interim data we can track progress toward our overarching goal.

Lena's creativity and willingness to contribute her unique skills to our team goal will make an enormous difference in our ability to make up for three months of lost data collection.

ICS: Would you recommend other teams identify a WIG?

NS: It really helps to have a really clear goal that you are aiming for. Cognitive scientists know better than most people how important goals are for guiding human behavior! The WIG model is one way to provide clarity and help teams work together to support a common goal. And it's nice to see your progress in a concrete way. It feels really good every time we update the dashboard and see our scores going up!

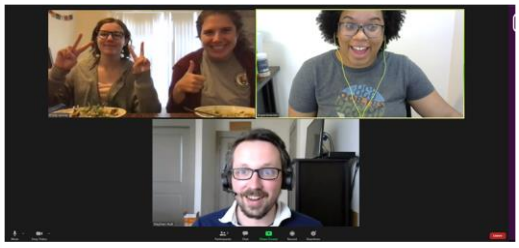
RESEARCH & LIFE AMIDST A PANDEMIC

The COVID-19 pandemic challenges us to develop different ways to conduct research and work with one another and our communities and manage our personal lives. Dealing with internet access issues, balancing working and parenting, loneliness, challenges with motivation all contribute to a difficult time of working from home during a major crisis.

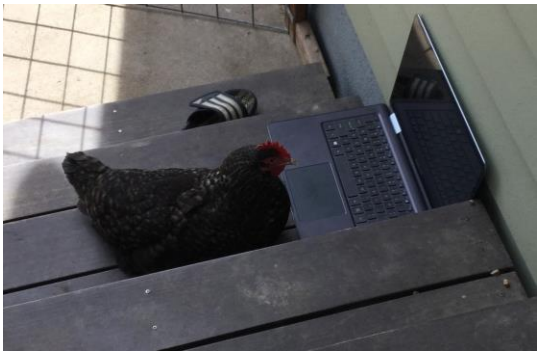
We hope that reading the following stories will help decrease the sense of isolation many people are feeling and communicate ways others are managing this new way to work and live life. Perhaps these examples will provide ideas on how you might try out various strategies mentioned by others. We may be physically isolated, but we continue to connect as a vibrant and supportive research community.

CONNECTING WITH TEAMS & COLLEAGUES

Sidney's lab Thursday lunch continues! Angela Stewart, Emily Jensen, Stephen Hutt and Collette Wilfong (not technically part of ICS, but a fellow STEM grad student).



Cinnamon Bidwell's chicken-double for Zoom. HA!



RESEARCH & LIFE AMIDST A PANDEMIC

CONNECTING WITH TEAMS & COLLEAGUES

Alice Healy College Professor of Distinction Emerita, and longtime ICS Fellow shared that "During isolation, I've also been spending much time going to lab meetings and other talks on Zoom and BlueJeans for the laboratories of Michael Kahana and John Trueswell at the University of Pennsylvania (Penn). Normally I go to those meetings in person because I am a volunteer Visiting Scholar in the Kahana lab at Penn, where I have my own office. During isolation as well as before that period I also spend much time in Skype and Face Time calls with my collaborators and former students in Boulder and elsewhere."

Laura Michaelis-Cummings ICS Fellow texts or video conference with at least one of her students every day and communicate with Linguistics faculty and fellow Social Science chairs through MS Teams." My very affable associate dean David Brown used to hold divisional happy hour every Tuesday at Aion Café, and now we have virtual Aion happy hour by Zoom. We raise our beverages and fiddle with our green screen backgrounds to display our favored retirement locations. I use Twitter and WhatsApp to check in with my close colleagues in Belgium and Greece just about every day."

She adds that an "enlightened Linguistics colleague Barbara Fox holds Zoom meditation sessions every Monday for the Linguistics department. Barbara's two cats make occasional appearances. I shut off cam and mic because I share my mat with my daughter and a yapping Chiweenie puppy. But it's nice to hear from those brave enough to share their post-meditation thoughts."

CONNECTING WITH TEAMS & COLLEAGUES
Continued

Teresa Sanders of SandersLab.org reports: "My team continues to make progress despite difficulties due to Covid19. I gave one of the last ICS talks before the shutdown and appreciate the participation from everyone who attended. I'm newly affiliated with Molecular, Cellular, and Developmental Biology, but my lab space opening in Gold has been pushed to the fall."

ICS Fellow Zach's Kilpatrick's group has been having monthly informal zoom lunches together in addition to our weekly zoom group meeting. Within my research group and collaborators, we have continued to use Skype/Zoom and Slack for research communications. "For a while we were howling together at 8pm, and we had brought out our mechanized Halloween werewolf (with flashing red eyes) to join in."

WORKING FROM HOME CO-WORKERS

Donna Caccamise, Associate Director of ICS seen here with Bella the lab and Brody the shepherd mix, supervising her work.

RESEARCH & LIFE AMIDST A PANDEMIC

PIVOTING RESEARCH TO MEET THE SITUATION

Marie Banich changed research protocols to look at stress and COVID-19
"We have just wrapped up data collection for a longitudinal study (NIH funded) in which we got a very rich set of brain measures (spectroscopy, anatomy, function) and an equally rich set of behavioral measures related to executive function and emotional function specifically with regards to depression and anxiety at 2 time points (2 years apart) in 140 adolescents/young adults (half male, half female) and 70 of their moms. Importantly, we also already have data on the stressors they have experienced up until this point in their lives and factors that influence the impact of stress (e.g., coping styles, their intolerance of uncertainty, etc.). Given that, we are gearing up to re-contact them at 8 time points over 4 months to get additional information on how COVID-19 is impacting them, their current levels of symptoms of depression and anxiety, and other related and important measures for which we have prior information (coping styles) as well as the degree to which they are currently using mental health services. The goal is to see if we can use the data on their brains and prior behavior to predict their response to this unprecedented situation. We have no money for this in the grant, so it's coming out of my research funds because I can't see passing this opportunity by……."

Donna Caccamise (PI) and Peter Foltz (co-PI) have a grant with the Dept. of Education, Institute for Educational Studies (IES) to develop an online web-based application that simultaneously teaches secondary students advanced reading comprehension skills that good students use to learn from text, while at the same time teaching them about a scientific subject, in this case ecology. Considering the COVID19 K-12 school shutdowns, the team is altering the application for easy access by parents for their stay at home school children. The target audience is secondary level. Up until now this app was only available by invitation to local schools, but with this new capability, the resource is now available on a nationwide basis to support at home learners. Parents and educators and see what the app is about and sign up at https://bravo.colorado.edu/

inquiryHub developed and delivered webinars and online PD. Led by Bill Penuel, the efforts "targeted to Open SciEd and iHub teachers, we are developing resources to adapt the routines and norms across our units for remote learning. The model is to bring a half-developed resource and then allow teachers to work together on Zoom to flesh it out in ways that match their realities. From slide presentations, PDFs and webinars, resources guide educators on how to use the curriculum materials in ways that support student learning while schools are closed. The webinar meetings connect researchers with teachers in similar situations and identify what types of solutions would be most helpful. Teachers are also encouraged to join our virtual communities and access free, digital resources and post ideas and materials in the inquiryHub Facebook Group and shared Google folders so we can learn from your efforts and work together to take on this challenge."

Also, for the Council of State Science Supervisors, Annie Allen and Bill are leading a set of self-care webinars for state science leaders focused on mindfulness and compassion, drawing on work of the Crown Institute.

RESEARCH & LIFE AMIDST A PANDEMIC

MANAGING WORK & HOME

Working-from-home in a crisis and managing work, children's education & mental and physical health, home life is enormously difficult. Thank you for the honest sharing, Nicole and Renee!

Nicole Speer reminds us that living in a world and life that are being upended, is an incredibly hard time for everyone.

She reminds us to follow the 'oxygen mask' rule on airplanes. Which is to be sure to take care of the basic necessities for self-survival first so that we can help other people, including our family.

Nicole tries to practice simple personal goal setting daily:

> "Give myself time to reflect on "what do I need". Just like with the work team check-ins, have daily check-ins with myself at the beginning and end of every day. I find this helpful."

She asks herself these questions:

> "What am I grateful for this morning?"
> "If I accomplish nothing else today, what is the one thing I would like to get done today", and this applies to both personal and professional work.

And at the end of the day she asks herself:

> "What went well today, what was hard/difficult, if given a chance what would I do differently?"

Renee Martin-Willett shared that at first, she tried to be 100% in both work and parenting and that did not work. So instead she now:

> Started creating "a goal a day" for her daughter by setting a daily school schedule, with 3 lessons a day, each lesson about an hour long, spread out throughout the day.
>
> Created an agreement with her husband to split the day so Renee spends the morning parenting and the afternoon focused on work.

She tries to "forgive myself. I tell myself that it's ok to not be as productive." This self-forgiveness is reinforced by her bosses and it helps that her bosses also clearly express gratitude toward her and her work.

She adds "I ask myself "What can I control in my life, what can I do to make the world a better place?""

MANAGING WORK & HOME
Continued

Zach Kilpatrick shared that he "setup a google sheets schedule with my partner breaking down our work time/essential meetings/watching our kiddo while he does school remotely. We try to have freshly made lunches and dinners together, and my partner and I each individually go on walks/runs once/day if possible, to get some alone time.

Laura Michaelis-Cummings says "Last spring, my research visitor Nikos Koutsoukos bought me a briki at the Omonoia Bakery on Colfax and taught my husband how to use it. So, my husband patiently makes me Greek coffee every morning and my daughter Shira brings it to me during my first Zoom meeting of the day. Crunching one's coffee does appear to enhance focus."

RESEARCH & LIFE AMIDST A PANDEMIC

HOME & COMMUNITY LIFE

Alice Healy shared that "During this isolation period, my husband Bruce and I are making sure to do a one-hour workout three days a week at home (we now live in an apartment on Rittenhouse Square in Philadelphia). The workout includes (among other activities) riding an exercise bike that we have at home. After the workout Bruce makes espresso drinks for us using beans that he ordered from Boulder's Ozo. Ordinarily we work out instead at our local health club (Rittenhouse Spa and Club), including a one-hour swim workout once a week, but naturally the health club is not open during isolation. Also, ordinarily after our workout we get coffee at a fabulous coffee shop in our apartment building (La Colombe), but that shop is also closed for the isolation period.

Cat Latzer, Ellen MacKenzie, Ann Eisenberg, and Yasko Endo have been busy sewing re-usable face masks for ICS and the greater community.

Cat and Ellen sewed 40 masks for the CINC labs' use as well as dozens of masks for health care workers, family, and friends.

Yasko worked with Boulder Mask Maker volunteer group to receive a donation of 60 masks for CINC labs' use. She has also sewn over 200 masks to donate to the Navajo Nation health care facilities, assisted care in Boulder and California, and community members who are essential workers.

Ann Eisenberg has been sewing for Boulder Community Hospital, family, and friends. It's Ann's way to give something back to their workers. And a wonderful memory of Mike using a sewing machine for the first time. Ann says, "he was a little terrified!".




Jean Bowen is working with a team to provide 'summer' snacks for 12 families of a local elementary school.

"We're packing up bags, based on the number of children per family, to help tide them over for the summer. These families are identified by the school as free or reduce lunch needs families. This is the third year we've done it, but this year we're expanding the number of items we're including for each family, realizing they may need more help than in the past. Taking this burden off the family, according to the school has been of great benefit --we select 'healthy' snacks as much as possible. We are doing it to establish a 'relationship' with the people in that school."

INC LEADS ICS CHARGE TO BUILD A MORE INCLUSIVE, DIVERSE, EQUITABLE RESEARCH COMMUNITY

Nicole Speer, INC Operation Director spoke to ICS on how working remotely during the global pandemic can be an opportunity to create a stronger foundation for inclusivity and diversity and ensure equitable participation in the community. This work involves growing our community's capacity for trust, understanding, commitment to collective success, and supporting one another.

Continuing to build community and developing a strong and effective team during this pandemic is important because "an effective team is made up of people who trust each other are willing to hold each other accountable." If a team member misses a goal, the individual and the team are able to honestly discuss what happened and how the team can work together to mitigate the delay. "You need to have trust along with vulnerability in a team that accepts that people make mistakes and that this is ok and that the team together will work to solve problems, change course, and make improvements."

Nicole says that teams benefit by agreeing that "being vulnerable and being ok with the fact that we don't know everything (is allowable within the team), and that you really have to lean on other people to help fill your blind spots."

Truly effective teams need a foundational structure, consciously creating an organization and team that is a safe environment where it is allowable for people to be vulnerable, where mistakes are learning opportunities and part of being human, where there is no shaming, blaming, putting people down.

Addressing the value of shifting thinking on goals from 'my' vs. 'ours', Nicole expressed that "it's good to be goal oriented and to have that clarity of what it is you are trying to achieve, and I think where we and organizations sometimes go wrong is that it's very focused on "what am I doing", "I am going to hit this number", instead of an all-encompassing "this is the team hitting this number", "We are all in this together". If one of us gets to the goal, then the rest of us must get there as well or it's all going to fall apart. Creating this common sense of purpose is really important and helpful (for an organization's overall success."

"Our current crisis is definitely a time when we need to help each other get through, because the time is really hard. The time is really hard in all kinds of different ways. It's not a time to get through the hardness on our own. We can help each other."

We will continue to be kind and compassionate with one another as we navigate these challenging times.

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HAVE QUESTIONS? NEED HELP?

NOTE: physical offices are currently closed due to COVID-19 facility closures, until further notice.

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CINC 182j: Thursdays 1-3pm

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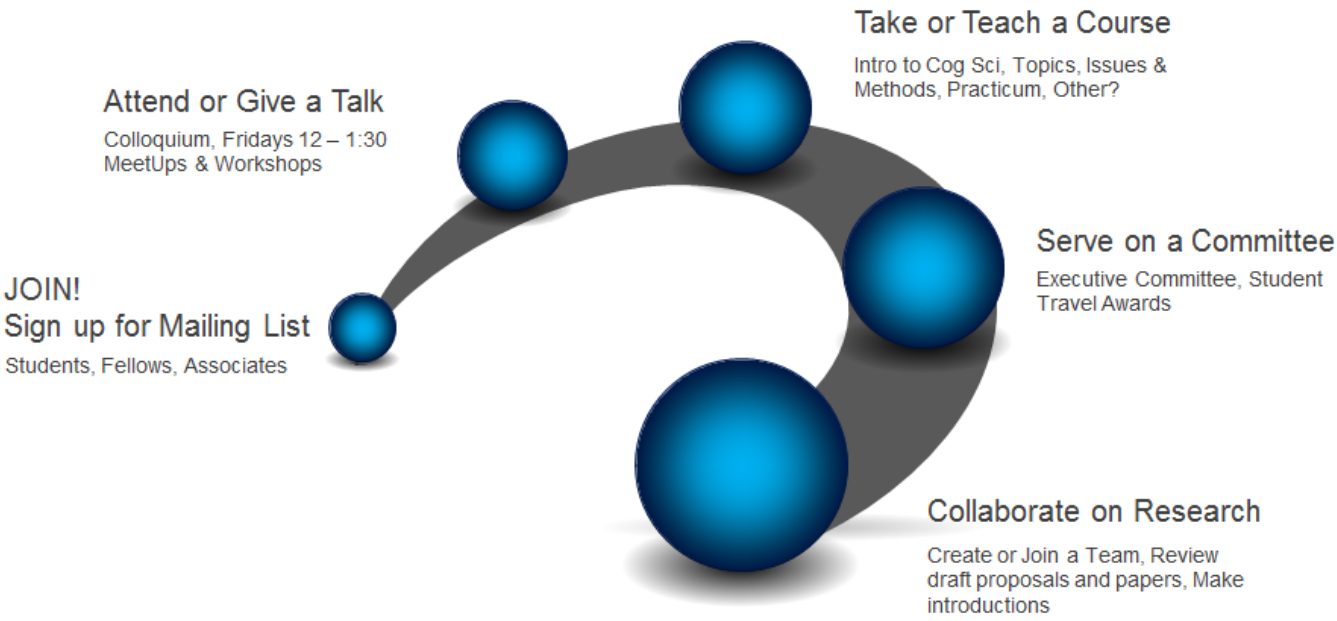
WAYS TO GET INVOLVED WITH ICS



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Our mission is to identify and address key questions in cognitive science. Through interdisciplinary research and education, we explore the nexus of humans and machines as we seek to understand and extend human cognition, machine intelligence, and fruitful collaborations between the two. Our research builds on artificial intelligence, cognitive neuroscience, human learning, and emotional processing to tackle some of society's most pressing challenges: understanding brain health and wellness, developing personalized therapies and interventions, enhancing and deepening human learning, and optimizing complex cognitive processes to improve human performance and collaboration

VISION

Our vision for ICS is:

- Be a campus leader in innovative, interdisciplinary research
- Be a campus leader in inclusiveness, diversity, and equity
- Reimagine our interdisciplinary educational programs
- Develop a robust resource engine to support future growth

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