



The Short Course on the Application of Machine Learning for Automated Quantification of Behavior

Bar Harbor, Maine
October 9 - 13, 2022

Schedule of Activities

Sunday, October 9

2:00 pm - 8:00 pm	<i>Registration & COVID-19 on-arrival testing</i>
6:00 pm	Dinner
7:00 pm	Poster Session

Monday, October 10

Fundamentals of Computer Vision and Machine Learning

7:00 am	<i>Breakfast</i>
8:00 am	Welcome & Announcements Vivek Kumar, Ph.D., The Jackson Laboratory
8:00 - 9:00 am	Introductions/What is Behavior Gordon Berman, Ph.D., Emory University
9:00 - 10:00 am	Keynote – Using Machine Vision and Learning to Analyze Animal Behavior (Remote Presentation) Kristin Branson, Ph.D., Janelia Research Campus
10:00 - 10:15 am	<i>Break</i>
10:15 - 11:15 am	Deep Learning-Based Pose Tracking Talmo Pereira, Ph.D., The Salk Institute for Biological Studies
11:15 - 12:15 pm	Behavioral Analysis with Deep Learning Alexander Mathis, Ph.D., Swiss Federal Institute of Technology
12:15 - 1:00 pm	<i>Lunch</i>
1:00 - 3:00 pm	Break for Activities led by Instructors

3:00 - 6:00 pm	Workshops – DLC and SLEAP Alexander Mathis, Ph.D., Swiss Federal Institute of Technology & Talmo Pereira, Ph.D., The Salk Institute for Biological Studies
6:00 - 7:00 pm	<i>Dinner</i>
7:00 - 8:30 pm	Evening Discussion Ishmal Abdus-Saboor, Ph.D., University of Pennsylvania

Tuesday, October 11

Fundamentals of Behavior Quantification

7:00 am	<i>Breakfast</i>
7:45 am	Announcements Gordon Berman, Ph.D., Emory University
8:00 - 9:00 am	Keynote - Interrogating Neural Mechanisms Underlying Spontaneous Behavior Using MoSeq Sandeep Robert Datta, M.D., Ph.D., Harvard Medical School
9:00 - 10:00 am	Measuring Behavior Across Scales Gordon Berman, Ph.D., Emory University
10:00 - 10:15 am	<i>Break</i>
10:15 - 11:15 am	Keynote – Quantifying and Modeling Social Behaviors (Remote Presentation) Mala Murthy, Ph.D., Princeton University
11:15 - 12:15 pm	Sparse Sensing and Control in Agile Movements (Remote Presentation) Bing Brunton, Ph.D., University of Washington, Seattle
12:15 - 1:00 pm	<i>Group Photo</i> <i>Lunch</i>
1:00 - 3:00 pm	Break for Activities led by Instructors
3:00 - 6:00 pm	Workshop – Using MotionMapper for Unsupervised Behavioral Analysis Gordon Berman Ph.D., Emory University <i>Teaching Assistant: Kanishk Jain</i>

Workshop – Characterizing the structure of mouse behavior using Motion Sequencing (MoSeq)

Sandeep Robert Datta, M.D., Ph.D., Harvard Medical School

Teaching Assistants: Winthrop Gillis & Sherry Lin

6:00 - 7:00 pm

Lobster Dinner

7:00 - 8:30 pm

Evening Discussion

Gordon Berman Ph.D., Emory University

Wednesday, October 12

Big Behavioral Data

7:00 am

Breakfast

7:45 am

Announcements

Ann Kennedy Ph.D., Northwestern University

8:00 - 9:00 am

Latent States of Neural Activity and Behavior

Scott Linderman, Ph.D., Stanford University

9:00 am - 10:00 am

Neurobiology of individuality

Benjamin De Bivort Ph.D., Harvard University

10:00 am - 10:15 am

Break

10:15 am - 11:15 am

Leveraging Lingual Dexterity to Study Error-Driven Motor Control

Jesse Goldberg, Ph.D., Cornell University

11:15 am - 12:15 pm

Applications of Machine Vision to Preclinical Mouse Models

Vivek Kumar, Ph.D., The Jackson Laboratory

12:15 pm - 1:00 pm

Lunch

1:00 pm – 3:00 pm

Break- Activities led by Instructors

3:00 pm - 6:00 pm

Workshops - RCR practices in BBD and BBD

Scott Linderman, Ph.D., Stanford University & Benjamin De Bivort
Ph.D., Harvard University

6:00 pm - 7:00 pm

Dinner

7:00 pm - 8:30 pm

Evening Discussion

Ann Kennedy Ph.D., Northwestern University

Thursday, October 13

Integration of Behavior, Neuroscience, and Genetics

7:00 am	<i>Breakfast</i>
7:45 am	Announcements Ishmal Abdus-Saboor, Ph.D., University of Pennsylvania
8:00 am - 9:00 am	Detailed Behavioral Tracking and its Applications in Neuroscience Bence Olveczky, Ph.D., Harvard University
9:00 am - 10:00 am	The Application of Machine Learning for Automated Quantification of Behavior Ishmail Adbus-Saboor, Ph.D., University of Pennsylvania
10:00 am - 10:15 am	<i>Break</i>
10:15 am - 11:15 am	Quantifying Behavior in Dyadic Social Interactions Ann Kennedy, Ph.D., Northwestern University
11:15 am - 12:15 pm	Quantifying Worm Behaviour in Multiwell Plates: A Few Challenges, Lots of Opportunities Andre Brown, Ph.D., Imperial College London
12:15 pm	<i>Shuttles & Carpool to Town Pier. Free parking at Bar Harbor Club</i>
12:30 pm - 2:30 pm	<i>Bay Cruise w/ Boxed Lunches</i>
2:30 pm	<i>Shuttles & Carpool to Highseas</i>
3:00 pm - 6:00 pm	Workshop - Supervised Behavior Analysis Vivek Kumar, Ph.D., The Jackson Laboratory & Ann Kennedy, Ph.D., Northwestern University <i>Teaching Assistants: Brian Geuther & Leinani Hession</i>
6:00 pm - 7:00 pm	<i>Dinner</i>
7:00 pm - 8:30 pm	Evening Discussion Vivek Kumar, Ph.D., The Jackson Laboratory

Friday, October 14

7:00 am - 9:00 am	<i>Grab-n-Go Breakfast & Departures</i>
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