CGSI

COMPUTATIONAL GENOMICS SUMMER INSTITUTE

2018

Long Course — July 11 - August 3

The long course provides additional instruction to more senior trainees, including advanced graduate students and postdocs. This part of the program provides a research residence program at UCLA where trainees will interact with world-leading researchers in the field of computational genomics. The program combines structured training programs with flexible time in order to encourage interaction and collaboration with other participants and program faculty.

SCHEDULE	Dates	Page
Big Bear Retreat	July 11th - 14th	5
First Short Course	July 16th - 20th	7
Long course –middle week	July 23rd - 27th	12
Second Short Course	July 30th - August 3rd	14
RESEARCH TALKS	45-minute explorations of current problems and research in computational genomics by participating faculty.	
TUTORIALS	interactive, guided 45-minute workshops that aim to help participants apply new techniques to research problems.	
JOURNAL CLUBS	45-minute sessions that give participants an opportunity to critically evaluate recent articles and stay up-to-date on relevant new research. As part of our Short Course, we will be breaking into small groups for daily journal clubs. Journal clubs provide an excellent opportunity to discuss current work and doing so with colleagues with shared interests can be insightful, productive, and fun.	
THE 2018 ORGANIZING COMMITTEE	Eran Halperin, UCLA CGSI Co-Director Eleazar Eskin, UCLA, CGSI Co-Director Fereydoun Hormozdiari, UC Davis David Koslicki, Oregon State University Kirk Lohmueller, UCLA Dima Shlyakhtenko, UCLA IPAM Director	

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Big Bear Lake Retreat July 11-14

The CGSI retreat will be a unique opportunity for faculty and Long Course participants to become acquainted and learn about each other's research in an informal setting. The 2018 CGSI retreat schedule includes research talks, flash talks, journal clubs, and social events.

ACCOMMODATION	The 2018 CGSI retreat will be held at the Best Western Hotel in Big Bear Lake, California. Hotel rooms have already been assigned to guests; please check in with your name. Complimentary breakfast served from 6:00 a.m. to 9:30 a.m. Best Western Big Bear Chateau 42200 Moonridge Rd, Big Bear Lake, CA 92315 (909) 866-6666
RESEARCH TALKS	This year's retreat features twelve 30-minute research talks presented by emerging scholars in the field of computational genomics. Each presenter compiled a list of relevant papers that provide a more in-depth exploration of their research talk material. Click to open a paper in your internet browser.
JOURNAL CLUB	As part of our annual retreat, we will be breaking into five small groups for daily journal clubs on July 12 and July 13. Journal clubs provide an excellent opportunity to discuss current work and doing so with colleagues with shared interests can be insightful, productive, and fun. Note required reading for each journal club.
ACTIVITIES	Arrangements for optional social events include dinners at local restaurants, hiking in the San Bernardino Mountains, soccer competitions at a nearby park, and free time at the hotel. The Best Western Big Bear Chateau features an outdoor heated swimming pool and hot tub, as well as a game room with a pool table.
RUN WITH SAGI SNIR	At 7:30am there will be a morning run, and at 8:00am we will hold a cool down session—led by world-renown scholar Dr. Sagi Snir. We invite you to join us for a leisurely and scenic jog around Big Bear. Wellness and sport are key aspects of the LA experience! Meet in the lobby of the hotel..
YOGA WITH ALISON SHAW	At 7:30am there will be a morning introduction to Yoga.

First Short Course

July 16-20

UCLA Faculty Center

The short course provides didactic training in computational and statistical genomic methods development. This part of the program is relevant to a wide range of trainees who are interested in developing or enhancing the methodology development aspect of their research program.

LOCATION	The First Short Course will be held in the California Room at the UCLA Faculty Center. The Faculty Center is situated in the heart of the UCLA campus. An attractive and comfortable private club that opened in 1959, the UCLA Faculty Center offers many well-furnished meeting rooms, lounges, patios, and dining facilities are available for a wide range of social and professional activities. 480 Charles Young Drive, Los Angeles, CA 90095-1617
PARKING	The closest lots to the Faculty Center is **Parking Structure 2**. Go to the Kiosk #2 in the sidewalk to pay for your permit.

Long Course - middle week

July 23-27

Gonda 1st floor Seminar Room

This week is the first week of the long course. The program includes talks in the morning and journal clubs. In addition, there is time in the afternoon to develop collaborations with other participants and faculty.

LOCATION	The Long Course will be held in the First Floor Conference Room in the Gonda Building. The Gonda (Goldschmied) Neuroscience and Genetics Research Center, is a state-of-the-art facility that helps researchers explore the depths of science. 200 Medical Plaza Driveway, Los Angeles, CA 90095
PARKING	The closest lots to the Gonda Building are **Parking Structure 8 and Parking Structure 9**. Go to the Kiosk Booth in the middle of the road to pay for your permit.

Second Short Course

July 30 - August 3

Engineering VI Mong Auditorium

The second short course provides a focus on computational methods in statistical and population genetics and computational methods in microbiome analysis. This part of the program is relevant to a wide range of trainees who are interested in developing or enhancing the methodology development aspect of their research program.

LOCATION	The Second Short Course will be in the building of Engineering VI Mong Auditorium 404 Westwood Plaza, Los Angeles, CA 90095, USA
PARKING	The closest lots to the Gonda Building are Parking Structure 8 and Parking Structure 9. Go to the Kiosk Booth in the middle of the road to pay for your permit.

Big Bear Lake Retreat

July 11-14

Wednesday July 11

16:00	Check-in Best Western Big Bear Chateau 42200 Moonridge Rd, Big Bear Lake, CA 92315
18:00	CGSI Retreat Dinner

Thursday July 12		Related papers	Talk slides
06:00-9:00	Breakfast		
07:30-9:30	Registration - Pick up your name tag in the hotel breakfast room!		
09:30-11:15	Introduction and Orientation		
11:15-12:00	Journal Club		
12:00	Lunch		
13:30	David Koslicki “Multi-resolution k-mer classification of metagenomic samples”		
14:15	Sagi Snir “Constructing the Microbial Tree of Life Using Quartet Based Approaches”		

16:00	Hiking in the San Bernardino Mountains @ Big Bear Discovery Center 40971 North Shore Drive/ Hwy 38, Fawnskin, CA 92333		
19:00	CGSI Retreat Dinner 40199 Big Bear Blvd, Big Bear Lake, CA 92315		

Friday July 13		Related papers	
06:00-9:00	Breakfast		
09:15	Jonathan Flint		
10:00	Sayan Mukherjee “Mapping epistatic traits using kernel methods and variance component models”		
10:45	Coffee Break		
11:15	Journal Club		
12:00	Lunch		
13:30	Ilan Gronau "Using the ancestral recombination graph to investigate species evolution”		
14:15	Jason Ernst “Computational approaches for understanding the noncoding human genome”		
15:30	Sports @ Meadow Park 41220 Park Ave, Big Bear Lake, CA 92315		
18:00	Dinner @ Paoli's Italian Country Kitchen 40821 Village Dr, Big Bear Lake, CA 92315		
20:00	Free Time in the Best Western Game Room and Outdoor Pool		

Saturday July 14

08:00-10:00	Journal Club Brunch and Social Activity
12:00	Check out of hotel

First Short Course

July 16-20

UCLA Faculty Center - California Room

Monday July 16		Related papers	Talk material
08:00	Registration and Breakfast - Check in and pick up your name tag during breakfast!		
09:00	Introduction - CGSI Organizing Committee		
09:15 Tutorial	Lior Pachter “What is CCA, why you should care, and how to use it “		
10:00 Tutorial	Saharon Rosset “The Multivariate Normal Distribution: Linear Mixed Models and Beyond”		
10:45	Coffee Break		
11:15	Journal Club		
12:00	Lunch on your own		
13:30	David Koslicki “IndeCut: Evaluating performance of motif discovery algorithms”		
14:15	Coffee Break		
14:45	Kirk Lohmueller “Methods for inference of purifying selection and dominance coefficients from genomic data”		
15:30	Coffee Break		
16:00	Fereydoun Hormozdiari “Contribution of structural variation to genome structure"		
17:00-18:00	Happy Hour @ Wolfgang Puck Express - Ackerman Union, Level 1, UCLA Campus We will hold happy hour at Wolfgang Puck, a bar on campus located just a few minutes' walk away from the Faculty Center. We strongly encourage all to attend these happy hours and to get to know your fellow course participants.		

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Tuesday July 17	California Room, UCLA Faculty Center	Related papers	Talk slides
08:30	Breakfast		
09:15	Jessica (Jingyi) Li “Statistical Methods for Bulk and Single-cell RNA-seq data”		
10:00 Tutorial	Can Alkan “Characterization of genomic structural variation using various sequencing technologies.”		
10:45	Coffee Break		
11:15	Journal Club		
12:00	Lunch on your own		
13:30	Michael Schatz "Advances in Genome Sequencing and Assembly"		
14:15	Coffee Break		
14:45	Jian Ma “Algorithms for studying nuclear genome organization and evolution”		
15:30	Coffee Break		
16:00	Eran Halperin “Methods for Deconvolution of Methylation Signals”		
17:00-20:00	Beach Picnic and Soccer Tournament @ Santa Monica Beach		

Wednesday July 18	California Room, UCLA Faculty Center	Related papers	Talk material
08:30	Breakfast		
09:15	Sayan Mukherjee “Compositional models for microbiome data and time series models for microbiome data”		
10:00	Sagiv Shifman "Essential genes linked to neurodevelopmental disorders"		
10:45	Coffee Break		

11:15	Sriram Sankararaman “Probabilistic modeling and inference in genomics”		
12:00 Tutorial	Bogdan Pasaniuc "How to identify susceptibility genes in post-GWAS studies."		
13:00	Lunch on your own		
13:00-18:00	Self-Guided Tour of Hollywood - We encourage CGSI participants to Lyft or Uber to Hollywood for a self-guided tour of the neighborhood.		
18:00-19:30	Picnic@HollywoodBowl - Grab food and snacks on your way over to the Hollywood Bowl Picnic Area!		
20:00-22:00	Hollywood Bowl Concert		

There are two ways to get to Hollywood:
1. Early in the afternoon, split into smaller groups and take Uber or Lyft to the historic Hollywood district. The average cost of an Uber or Lyft ride from Westwood to Hollywood is $18 (please note that we cannot control the rate of Uber or Lyft fares). We provide on the following page recommendations for lunch, sightseeing, and purchasing food and drinks for the picnic and show at Hollywood Bowl.
2. Late in the afternoon, take the Hollywood Bowl shuttle bus from Westwood (Veteran Ave at Wilshire Blvd) to Hollywood. This shuttle is $7 both ways, and the earliest departure is 5:30pm. You may request one shuttle ticket when RSVPing for the event. Participants who take the shuttle will arrive at the Bowl just in time for theshow and will not arrive in time for the picnic. If you wish to take the bus, please let a volunteer know—we will walk you from campus to the bus stop.
We recommend purchasing food and drinks in Westwood, beforeleaving, and bringing your personal picnic to the Hollywood Bowl as your dinner during the show.

Where to buy food for the picnic and concert.
Join us for a picnic at 6:00pm—bring your own food and drink—and walk with us to the bowl at 7:30pm.
In addition, the evening’s Bowl performance allows guests to bring their own food and drink. We suggest stopping by the following stores to grab food, snacks, and drinks. Bring your leftovers to the show!
Trader Joe’s 1600 Vine St, Los Angeles, CA 90028
Yucca Supermarket 1815 N Cahuenga Blvd, Los Angeles

How to get to the Hollywood Bowl.
We reserved a picnic area for CGSI participants to meet and hang out before heading up to the venue. From the picnic area, the bowl is a 0.5-mile uphill walk and takes approximately 15 minutes.

Thursday July 19 Center	California Room, UCLA Faculty	Related papers	Talk material
08:30	Breakfast		
09:15 Tutorial	Mark Chaisson "Detecting variation using single-molecule sequencing"		
10:00	Iuliana Ionita “Statistical methods for the integration of functional genomics data and whole exome/genome sequencing data for improved gene discovery”		
10:45	Coffee Break		
11:15	Journal Club		
12:00	Lunch on your own		
13:30 Tutorial	Ilan Gronau “Bayesian comparison of demographic models”		
14:15	Coffee Break		
14:45	Cenk Sahinalp “Tumor evolution modeling through the use of single cell and bulk sequencing data".		
15:30	Coffee Break		
16:00 Tutorial	Brian Browning “Genotype imputation with large reference panels in the cloud.”		
17:30-19:00	Bike Ride along Santa Monica beach Possibility of keeping the Bike overnight until 10 am - extra $10 Fill out the Contract Agreement prior your arrival.		
19:00	Dinner on your own in Santa Monica		

Friday July 20	California Room, UCLA Faculty Center	Related papers	Talk material
08:30	Breakfast		
09:15	James Zou "Contrastive learning with applications to biomedical data"		
10:00	Sagi Snir “Non linearity of Epigenetic Aging is Detected via the Universal PaceMaker"		
10:45	Coffee Break		
11:15	Journal Club		
12:00	Lunch on your own		
13:30 Tutorial	Jason Ernst “Computational Epigenomic Approaches for Interpreting the Non-coding Human Genome”		
14:15	Coffee Break		
14:45 Tutorial	Vikas Bansal "Haplotyping human genomes using whole-genome sequencing"		
15:30	Coffee Break		
16:00	William (Xiaoquan) Wen “Bayesian integrative analysis of molecular QTL and GWAS data”		
17:00-18:00	Happy Hour @ Wolfgang Puck Express - Ackerman Union, Level 1, UCLA Campus		

Saturday July 21

9:00-12:00	Volleyball & Soccer @ Santa Monica Beach	

Long Course - middle week

July 23-27

Gonda 1st floor Seminar Room

Monday July 23		Related papers	Talk material
08:30	Breakfast		
09:15-10:00	Saharon Rosset “The Magical Multivariate Normal Distribution: Some Properties and Applications”	p. 743–755	
10:00-10:30	Coffee Break		
10:15-11:15	Mark Chaisson "Resolving multicopy duplications using assembly by phasing"		
11:15-11:35	Long Course Orientation		
11:35-12:20	Journal Club		
12:20	Lunch Break		
17:00	Dinner TBA		

Tuesday July 24 Gonda 1st floor Seminar room		Related papers	Talk material
08:30	Breakfast		

09:15-10:00	Rayan Chikhi “Data structures for k-mers (applications: reference-free sequencing data analysis)”		
10:00-10:30	Coffee Break @ Engineering VI 2nd floor interaction area		
10:30-11:15	Or Zuk “Improved Deep-Learning Methods for Enhancers Identification and Interpretation”		
11:15-12:00	Journal Club		
12:00	Lunch Break		
15:00	Special Coffee Break @ Engineering VI 2nd Floor Interaction Area		

Wednesday July 25

08:30-14:45	Long Course Day Three - DAY OFF

Thursday July 26 room	Gonda 1st floor Seminar	Related papers	Talk material
08:30	Breakfast		
09:15	Jo Hardin “Issues in sequencing depth when clustering genetic profiles measured across varying levels of Rpos protein”		
10:00-10:30	Coffee Break @ Engineering VI 2nd floor interaction area		
10:30	Ben Raphael “Inferring Cellular Migrations in Metastatic Cancers”		
11:15-12:00	Journal Club		
12:00	Lunch Break		
18:00	Dinner TBA		

Friday July 27 room	Gonda 1st floor Seminar	Related papers	Talk material
08:30	Breakfast		
09:15-10:00	Lior Pachter “(Computational and experimental) methods for multiplexed single-cell RNA-Seq”		
10:00	Coffee Break @ Engineering VI 2nd floor interaction area		

10:30-11:15	Jae Hoon Sul “Contribution of common and rare variants to bipolar disorder susceptibility in population isolates.”		
11:15	Journal Club		
12:00	Lunch Break		
15:00	Special Coffee Break @ Engineering VI 2nd Floor Interaction Area		

Saturday July 28

DAY OFF

Second Short Course

July 30 - August 3

Engineering VI Mong Auditorium

Monday July 30		Related papers	Talk material
08:30	Breakfast		
09:15 Tutorial	Ben Langmead "Using huge public sequencing datasets to answer scientific questions"		
10:00	Coffee Break		
10:30	Eytan Ruppin “Harnessing genetic interactions to advance whole genome precision oncology”		
11:15	Journal Club		
12:00	Lunch Break		
13:30 Tutorial	Rayan Chikhi “Methods for metagenome assembly (de Bruijn graphs)”		
14:15	Special Coffee Break		
14:45 Tutorial	Pavel Pevzner “Estimating metagenome diversity by hybrid sequencing by short and long reads”		

15:30-16:00	Coffee Break and Secord Short Course Orientation		
16:00-16:45	Eleazar Eskin “Discovering the Causal Variants Involved in GWAS Studies”		
18:00	CGSI Dinner at 800 Degrees Pizza, Westwood.		

Tuesday July 31 Auditorium	Engineering VI Mong	Related papers	Talk material
08:30	Breakfast		
09:15 Tutorial	Sohini Ramachandran “Applications of Latent Dirichlet Allocation in genomics"		
10:00	Coffee Break		
10:30	Sharon Aviran “Automated recognition of functional RNA elements by their SHAPE data signatures”		
11:15 -11:45	Coffee Break		
11:45	Ran Bleckhman Genetics, Cell Biology, and Developmental Ecology, Evolution and Behavior		
12:00	Lunch and free afternoon		
16:00	BBQ at Will Rogers State Park Rd, Pacific Palisades, CA 90272 UBER or Parking is $12.00 per vehicle		

Wednesday August 1 Auditorium	Engineering VI Mong	Related papers	Talk material

08:30	Breakfast		
09:15 Tutorial	Nick Chia “Understanding the interface between microbial metabolism and colon cancer”.		
10:00	Coffee Break		
10:30	Emilia Huerta Sanchez “The impact of admixture on patterns of human genetic variation”		
11:15	Journal Club		
12:00	Lunch Break		
13:30 Tutorial	Thomas Sharpton “Imputing the functional capacity of microbiomes through metagenome annotation”		
14:15 -14:45	Special Coffee Break		
14:45 Tutorial	John Novembre "Methods to characterize geographic structure in genetic variation"		
18:00-19:30	Picnic@HollywoodBowl - Grab food and snacks on your way over to the Hollywood Bowl Picnic Area!		
20:00-22:00	Hollywood Bowl Concert		

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Yucca Supermarket 1815 N Cahuenga Blvd, Los Angeles

How to get to the Hollywood Bowl.
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Thursday August 2 Auditorium	Engineering VI Mong	Related papers	Talk material
08:30	Breakfast		
09:15	Shai Carmi "Hidden Markov Models for pre-implantation genetic testing and ancient DNA"		
10:00	Coffee Break		
10:30	Murat A. Eren "From characterizing genomic heterogeneity within single populations to investigating evolutionary forces acting on environmental microbes"		
11:15	Journal Club		
12:00	Lunch Break		

13:30 Tutorial	Siavash Mirarab “Genome-wide species tree reconstruction despite gene tree discordance.”		
14:15 - 14:45	Special Coffee Break		
14:45 - 15:30	James Zou "Tutorial of optimal transport with applications in genomics"		
16:30	Walking tour of Venice Canals and dinner on your own		

Friday August 3 Auditorium	Engineering VI Mong	Related papers	
08:30	Breakfast		
09:15 Tutorial	Daniel Wegmann "Incorporating genotype uncertainty in population genetics: general concepts and applications to ancient DNA"		
10:00	Coffee Break		
10:30	Vineet Bafna “Extrachromosomal DNA and complex structural variation in tumor genomes”		
11:15	Journal Club		
12:00	Lunch Break		
13:30	Or Zuk “Inference of Selection from Intra-Species and Inter-Species Variation”		
14:15-14:45	Special Coffee Break		
14:45-15:00	John Novembre “Inference of haplotype (or community) composition in pooled sequence data”		
17:00-18:00	Happy Hour @ Wolfgang Puck Express - Ackerman Union, Level 1, UCLA Campus		

Lunch Recommendations

We recommend visiting the following restaurants in smaller groups

Musso & Frank Grill	6667 Hollywood Blvd, Los Angeles, CA 90028 (323) 467-7788	Classic American fare at Hollywood's oldest eatery
25 Degrees - Hollywood Roosevelt Hotel	7000 Hollywood Blvd, Los Angeles, CA 90028 (323) 785-7244	Vintage pub with burgers, shakes, & glam decor
Loteria Grill – Hollywood	6627 Hollywood Blvd, Los Angeles, CA 90028 (323) 465-2500	Creative takes on classic Mexican eats & a full bar
Stout Burgers and Beer	1544 N Cahuenga Blvd, Los Angeles, CA 90028 (323) 469-3801	Casual gastropub with inventive burgers & craft beer
Kino Sushi	6721 Hollywood Blvd, Los Angeles, CA 90028 (323) 465-4567	Popular Japanese, Korean & Chinese fare
Pig 'N Whistle	6714 Hollywood Blvd, Los Angeles, CA 90028 (323) 463-0000	1920s pub serves up drinks & Continental fare
Luv2eat Thai Bistro	6660 Sunset Blvd P, Los Angeles, CA 90028 (323) 498-5835	Classic Thai eatery for familiar favorites
JINYA Ramen Express	6801 Hollywood Blvd, #317, Los Angeles, CA 90028 (323) 391-1916	Counter service with ramen bowls & Japanese sides
Umami Burger Hollywood	1520 N Cahuenga Blvd, Los Angeles, CA 90028 (323) 469-3100	Lively chain serving elevated burgers & craft beer
Urban Masala	6554 Hollywood Blvd, Los Angeles, CA 90028 (323) 957-9999	Modern spot with quick-serve Indian eats

Places to go

Angeles Walk LA: Self-Guided Historic Trails	

Hollywood Cemetery Self-Guided Tour	
FieldTripper App	
The Real Los Angeles Self-Guided Tours	
TimeOut: 22 must-see Hollywood attractions	
Fodor’s Travel: Hollywood Sights	