

1	April 4	Review of basic concepts
2	April 6	Heritability
3	April 11	Mixed models
4	April 13	PCA and factor analysis
5	April 18	Guest lecture (Bogdan Pasaniuc)
6	April 20	Multiple testing (Nolan Donoghue)
7	April 25	Imputation (Ariel Wu)
8	April 27	Correcting for confounders (Ruth Johnson)
9	May 2	Phasing (Kathy Burch)
10	May 4	Causality (Jazlyn Mooney)
11	May 9	Gene expression analysis (Gleb Kichaev)
12	May 11	The coalescent (Michael Thompson)
13	May 16	Deep learning in genomics (Lisa Gai)
14	May 18	Demographic inference (Arun Durvasula)
15	May 23	Guest lecture (Jason Ernst)
16	May 25	Admixture
17	May 29	Epigenome-wide association analysis
18	May 31	Project presentations
19	June 6	No class
20	June 8	Project presentations

Project presentation schedule:

May 31:

1. Arun/Jazlyn
2. Ariel
3. Nolan

June 8 :

1. Ruth
2. Kathy
3. Mike
4. Lisa
5. Gleb

1. Models of genetic variation
Li and Stephens Genetics 2003
2. Heritability
Zuk et al. PNAS 2011
Yang et al. Nature Genetics 2010
3. Linear Mixed Models
Lippert et al. Nature Methods 2012
Loh et al. Nature Genetics 2015
4. PCA and factor analysis
Patterson et al. PLoS Genetics 2006
Price et al. Nature Genetics 2006
Engelhardt and Stephens, PLoS Genetics 2012
5. Imputation
Howie et al. Nature Genetics PLoS Genetics 2009
Dahl et al. Nature Genetics 2016
6. Fine-mapping
Hormozdiari et al. Genetics 2014

Kichaev et al. PLoS Genetics 2014

7. Risk prediction

Carbonetto and Stephens, Bayesian Analysis 2012

Logdson et al. BMC Bioinformatics 2010

Hoggart et al. PLoS Genetics 2008

8. Multiple testing

Moskvina and Schmidt AJHG 2008

Han et al. PLoS Genetics 2009

9. Correcting for confounders

Kang et al. Genetics 2008

Kang et al. Nature Genetics 2010

Song et al. Nature Genetics 2015

10. Phasing

Loh et al. Nature Genetics 2016

O'Connell et al. Nature Genetics 2016

11. Epigenome-wide Association Studies

Houseman et al. BMC Bioinformatics 2012

Rahmani et al. Nature Methods 2016

12. Gene expression analysis

Stegle et al. PLoS Computational Biology 2010

13. Causality (Mendelian randomization, mediation)

Sheehan et al. Genetic Epidemiology 2011

Bowden et al. IJE 2015

14. Compressed storage (PBWT, Li-Stephens on PBWT)

Durbin, Bioinformatics 2014

Lunter, Biorxiv 2016

15. Deep learning

Sheehan and Song, PLoS Computational Biology 2015

Zhou and Troyanskaya Nature Methods 2015

Alipanahi et al. Nature Biotechnology 2014

16. Privacy-preserving GWAS

Dwork et al. 2014

Simons et al. Cell Systems 2015

17. The coalescent

Wakeley, chapter 3

(http://dna.ac/filogeografia/PDFs/Wakeley/Wakeley_06_Chapter_3.pdf)

18. Demographic inference

Li and Durbin Nature 2011

Palacios and Ramachandran Genetics 2016

19. Selection

Voight et al. PLoS Biology 2006

Field et al. Science 2016

20. Admixture

Pritchard et al. Genetics 2002

Alexander et al. Genome Research 2009

Raj et al. Genetics 2014

Gopalan et al. Nature Genetics 2016

21. Ancient DNA

Green et al. Science 2010

Mathieson et al. Nature 2016