

TIGP Bio 2022 Spring Syllabus

Advanced Algorithms (C2)

For the latest syllabus, please visit the BP website: <https://tigpbp.iis.sinica.edu.tw>

<p>Place: Room 107, New Building of the Institute of Information Science, Academia Sinica.</p> <p>Time: Friday 14:00-17:00</p> <p>Chair: Dr. Chien-Yu Chen (chienyuchen@ntu.edu.tw)</p> <p>Outline: This course is basically about data mining, machine learning and statistical modeling from data, and some other algorithms and applications.</p> <p>Resources: There are 8 topics given in the way of Videos Preview (about 2~3 hours) + In-class discussions (about 1~1.5 hours). Below please find the link that WILL provide the links of the following: (1) the videos to be watched BEFORE the class (2) the questions to be discussed IN the class (3) the homework to be completed AFTER the class https://docs.google.com/spreadsheets/d/16qsIvscxgw5iqAGNxSU-IFSx3a089A5qTTk6QTidKmg/edit?usp=sharing</p> <p>References: (reserved in the library of the Institute of Information Science) 1. Learning from Data- A Short Course (Abu-Mostafa, Magdon-Ismael, Lin, 2012) 2. Learning Pattern Classification (Duda, Harg, and Stork, 2001) 3. An Introduction to Support Vector Machines and Other Kernel-based Learning Methods (Cristianini and Shawe-Taylor, 2000) 4. [DL in Life Science] https://mit6874.github.io/ 5. [ML for Genomics] https://www.classcentral.com/course/youtube-6-047-6-878-machine-learning-for-genomics-fall-2020-48203</p> <p>TA: David Nicola Streuli (d.s.account@hotmail.ch) Office hours: Friday 10:00 am-12:00 pm Office location: Room 709, Inst. Biological Chemistry, Academia Sinica (changed to online format since 5/3) Grades: Midterm exam 50%. Final exam 50%.</p>

【For Non-BP student】

<p>For Non-BP student to register/sit-in any BP course, it is required to gain course chair's permission: (1) Basic Enrollment Information form (http://bit.ly/3g22mfl) (2) TIGP-BP Course Registration Consent Form (http://bit.ly/3ubl2Bs)</p> <p>※ Deadline: the 4th week of each semester. ※ Signature of the course chair should be collected before submission. Incomplete form will not be accepted. ※ Course grade will NOT be given (even class enrollment is completed at school) if fail to follow the above procedures.</p>
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Week	Date	Topics/Brief Description	Lecturers	Lecture Style	Evaluation Method
1	2022/2/18	Data Classification	Dr. Li Su	Lectures	HW with a specified deadline
2	2022/2/25	Preview Week (no class)	[DL in Life Science]		
3	2022/3/4	[DL in Life Science] Convolutional Neural Networks, Recurrent Neural Networks, Graph Neural Networks	Dr. Chien-Yu Chen	Preview videos + in-class discussions	HW with a specified deadline
4	2022/3/11	[DL in Life Science] Epigenomics	Dr. Huai-Kuang Tsai	Preview videos + in-class discussions	HW with a specified deadline
5	2022/3/18	Identification and analysis of circular RNAs	Dr. Trees-Juen Chuang	Lectures	HW with a specified deadline
6	2022/3/25	[DL in Life Science] GWAS and Variants	Dr. Tzu-Pin Lu	Preview videos + in-class discussions	HW with a specified deadline
7	2022/4/1	Single cell RNA-seq	Dr. Yao-Ming Chang	Preview videos + in-class discussions	HW with a specified deadline
8	2022/4/8	Midterm Exam (take-home exams, no class)	--		
9	2022/4/15	Hidden Markov Models	Dr. Yu Tsao	Lectures	HW with a specified deadline
10	2022/4/22 @Webex	Network Analysis	Dr. Hsuan-Cheng Huang	Lectures	HW with a specified deadline
11	2022/4/29 @Webex	[DL in Life Science] Graph Analysis [DL in Life Science] Drug Discovery	Dr. Hsuan-Cheng Huang	Preview videos + in-class discussions	HW with a specified deadline
12	2022/5/6 @Webex	[DL in Life Science] Protein Structure Prediction	Dr. Chien-Yu Chen	Preview videos + in-class discussions	HW with a specified deadline
13	2022/5/11 (Wed) @Webex	Advanced Algorithms for Proteomics	Dr. Ching-Tai Chen	Preview videos + in-class discussions	HW with a specified deadline
14	2022/5/18 (Wed) @Webex	Biological systems modeling	Dr. An-Chi Wei	Preview videos + in-class discussions	HW with a specified deadline
15	2022/5/27	Review Week (no class)	--		
16	2022/06/03 (Holiday)	Holiday--Dragon Boat Festival (no class)	--		
17	2022/6/10	Final Exam (take-home exams, no class)	--		