

Syllabus

General Information

- Instructor: Yili Hong, PhD
- Office: 213 Hutcheson Hall; Phone: 540-231-9710; Email: yilihong@vt.edu
- Class time and place: TR 8:00am-9:15am; Seitz 313
- Office hours: T: 3pm-4pm, W: 2:30pm-3:30pm, or by appointment.

Resources

- Reference books:
 - John P. Klein and Melvin L. Moeschberger (2003). *Survival Analysis: Techniques for Censored and Truncated Data (2nd Edition)*, Springer.
 - William Q. Meeker and Luis A. Escobar (1998). *Statistical Methods for Reliability Data*, Wiley.
 - Ian Goodfellow, Yoshua Bengio and Aaron Courville (2016), *Deep Learning*, MIT Press.
- Software: TensorFlow, <https://www.tensorflow.org/>
- Course webpage: <https://canvas.vt.edu>

Description

“Topics in Biostatistics” is taught as a seminar course this semester. The specific topics that we are going to explore are “Deep Learning and Applications in Survival Analysis.” The course is structured as a combination of lectures by the instructor, student paper reading and presentation, and final course project.

Survival data, or more generally referred to as time to event data, are very common in many areas. In some applications, the objective is to predict the time to event. Deep learning techniques have been successfully applied to many prediction problems. This seminar course explores the potential applications of deep learning in time to event predictions.

The first part covers essentials in survival analysis and prediction problems in survival analysis. The second part covers basics in deep learning, convolutional neural networks, and recurrent neural networks. The third part focuses on the interface of time to event prediction and deep learning.

Prerequisites: statistics MS core courses or equivalent.

Evaluation

- Letter grade will be given based on homework (25%), the first mid-term (20%), the second mid-term (20%), and the final exam (35%).
- Homework: Biweekly. Turn them in at the beginning of the class on the date it is due. NO late homework will be accepted.
- First Mid-term: take home, Thursday, February 22rd.
- Second Mid-term: take home, Thursday, April 12rd.
- Final Project: students are expected to complete a final course project and submit a written report. Teamwork is encouraged. Due Monday, May 07th, 4:05pm.

Academic Integrity

Students are expected to abide by Virginia Tech's Community Standard for all work for this course (<http://www.honorsystem.vt.edu/>). Violations of the Standard will result in a failing final grade for this course and will be reported to the Dean of Students for adjudication. Ignorance of what constitutes academic dishonesty is not a justifiable excuse for violations.

Special Accommodation

As supported by Virginia Tech's Principles of Community (<http://www.vt.edu/diversity/principles-of-community.html>), all students will be treated equally. Those with special needs can be accommodated and should refer to the website <http://www.ssd.vt.edu/> for specific questions.