Course Syllabus
Special Summer Program 2020

<table>
<tr><td>Course title</td><td colspan="3">Application of machine learning/text mining on the macroeconomics analysis (in R)</td></tr>
<tr><td>Month of offering the course</td><td>July ☐
August ■</td><td>Way of teaching</td><td>F2F ☐
Online (Zoom) ■</td></tr>
<tr><td>Teaching schedule</td><td colspan="2">Day of the Week: 1</td><td>Time: Friday 8:50 - 12:00</td></tr>
<tr><td>Names of Instructor</td><td colspan="2">Chingyang Lin</td><td>Total No. of Classes (90min)
8</td></tr>
<tr><td>Course description</td><td colspan="3">This course introduces the concept and machine learning and its application on macroeconomics analysis. Specifically, we will explore several core questions/issues such as
1) What is the underlying logic of machine learning—How does the machine learn and how does the machine make predictions?
2) What's the difference between machine learning and the econometrics methods we learn?
3) How do people use this approach to analyze economic problems? For instance, can machines predict/understand central banks' monetary policy?

Besides, this course also introduces the methods of text mining and its implication on economics/finance analysis problems, such as how the central bank's policy statement influences the stock price? How we analyze people's expectations using newspaper articles.

Lastly, students will learn how to use R (an application for statistical computing) as the platform to implement the abovementioned machine learning methods.</td></tr>
<tr><td>Texts
(readily available for free should be chosen)</td><td colspan="3">1. ***Neural Networks and Deep Learning,*** by Michael Nielsen (free online book http://neuralnetworksanddeeplearning.com)
2. **Text Mining with R,** by Julia Silge and David Robinson. (free online book https://www.tidytextmining.com)</td></tr>
<tr><td>Remarks
(delivery methods, pre-requisite, class outline, etc.)</td><td colspan="3">1. To fully understand the course content, some basic knowledge in calculus and optimization theory is required. Complete the following prerequisite courses are highly recommend: "Statistical Methods" and "Mathematics for Economics and Management".
2. By the end of this course, students will complete a small research project using R. Nonetheless, computer programming experiences are not required.</td></tr>
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