

Syllabus: CS444 (Fall 2020): Topics in Computer Science

Canvas Site

- <https://rutgers.instructure.com/courses/65637>

Meeting Days & Times

- The course is remotely instructed via Zoom. Link for the Zoom meeting is posted on the course canvas site.
- Lecture times: Tuesday and Thursday 5:00 pm - 6:20 pm

Instructor Info

- Sungjin Ahn
- Contact info: sungjin.ahn@rutgers.edu
- The contact via email is usually responded within two business days.

Office Hour

- Every Tuesday between 9 am - 10 am via Zoom. The Zoom link is posted on the course canvas site.
- As there can be multiple students waiting for the office hour, making an appointment is required (please send an email to the instructor in advance and schedule a slot within the office hour.)

Technology Requirements

- A computer, mic/audio system, and access to the Internet to participate in the lectures via Zoom
- Please visit the Rutgers Student Tech Guide page for resources available to all students. If you do not have the appropriate technology for financial reasons, please email Dean of Students deanofstudents@echo.rutgers.edu for assistance. If you are facing other financial hardships, please visit the Office of Financial Aid at <https://financialaid.rutgers.edu/>.

Learning Goals

- The principal purpose of this course is to introduce deep learning through a comparative presentation of methodology. The course mainly focuses on the fundamentals of deep neural networks and its applications to natural language processing, computer vision, and deep generative modeling. The course is intended for CS students with an applied mathematics orientation and knowledge on essential machine learning, and also for students in other programs (computer and electrical engineering, statistics, mathematics, psychology) who are interested in this topic.
- The course will cover traditional neural networks architectures, including feed-forward neural networks, convolutional neural networks, recurrent neural networks as well as

recent advances such as attention mechanisms, batch normalization, transformer, etc. An essential goal of the course is for the students to learn to build their own DL toolbox using PyTorch. The course will also cover some advanced topics like generative models and reinforcement learning if time allowed.

Required Books and Materials

- There is no required book for this course. The following books can be useful though as references on relevant topics.
 1. Dive into Deep Learning (<https://d2l.ai/>),
 2. Deep Learning (DL), Goodfellow, Ian and Bengio, Yoshua and Courville, Aaron, MIT Press, 2016, ISBN: 9780262035613
 3. Pattern Recognition and Machine Learning (PRML), Christopher C. Bishop, Springer, 2006, ISBN: 9780387310732
 4. Natural Language Processing with Distributed Representations (NLP), Kyunghyun Cho, <https://arxiv.org/abs/1511.07916>

Course Structure and Requirement

- Attendance (15%), Assignment 1-4 (15% each, total 60%), and Final Project (25%)
- Attendance policy
 - One absence is allowed and will not affect your score. From the second absence, a reasonable explanation with supporting evidence is required not to lose the attendance point.
 - Each absence without a reasonable explanation will lose 3% of the score.
- Late submission will lose 2% every day
- The final project is a 1~3 person team project. The project consists of (1) proposal writing, (2) final presentation, and (3) final report. More details will be explained in class.

Final Exam/Paper Date and Time

- There is no mid & final exam.

Self-Reporting Absence Application

- Students are expected to attend all classes; if you expect to miss one or two classes, please use the University absence reporting website <https://sims.rutgers.edu/ssra/> to indicate the date and reason for your absence. An email is automatically sent to me.

Current Academic Integrity Policy:

- Honor pledge:
 - All students will need to sign the Rutgers Honor Pledge on every major exam, assignment, or other assessment as follows: *On my honor, I have neither received nor given any unauthorized assistance on this examination (assignment, paper, quiz, etc.).*
- Rutgers University takes academic dishonesty very seriously. By enrolling in this course, you assume responsibility for familiarizing yourself with the Academic Integrity Policy

and the possible penalties (including suspension and expulsion) for violating the policy. As per the policy, all suspected violations will be reported to the Office of Student Conduct. Academic dishonesty includes (but is not limited to):

- Cheating
 - Plagiarism
 - Aiding others in committing a violation or allowing others to use your work
 - Failure to cite sources correctly
 - Fabrication
 - Using another person's ideas or words without attribution—re-using a previous assignment
 - Unauthorized collaboration
 - Sabotaging another student's work in doubt, please consult the instructor
- Use of external website resources such as Chegg.com or others to obtain solutions to homework assignments, quizzes, or exams is cheating and a violation of the University Academic Integrity policy. Cheating in the course may result in grade penalties, disciplinary sanctions or educational sanctions. Posting homework assignments, or exams, to external sites without the instructor's permission may be a violation of copyright and may constitute the facilitation of dishonesty, which may result in the same penalties as plain cheating.

Misappropriating intellectual property.

- Almost all original work is the intellectual property of its authors. These works may include syllabi, lecture slides, recorded lectures, homework problems, exams, and other materials, in either printed or electronic form. The authors may hold copyrights in these works, which are protected by U.S. statutes. Copying this work or posting it online without the permission of the author may violate the author's rights. More importantly, these works are the product of the author's efforts; respect for these efforts and for the author's intellectual property rights is an important value that members of the university community take seriously. For more instructions on copyright protections at Rutgers University, please refer to the Rutgers Libraries.

Student-Wellness Services

- All of these services are being provided remotely during Fall 2020.
- Counseling, ADAP & Psychiatric Services (CAPS)
(848) 932-7884 / 17 Senior Street, New Brunswick, NJ 08901/
<http://health.rutgers.edu/medical-counseling-services/counseling/>
CAPS is a University mental health support service that includes counseling, alcohol and other drug assistance, and psychiatric services staffed by a team of professionals within Rutgers Health services to support students' efforts to succeed at Rutgers University. CAPS offers a variety of services that include: individual therapy, group therapy and workshops, crisis intervention, referral to specialists in the community, and

consultation and collaboration with campus partners.

- Crisis Intervention :
<http://health.rutgers.edu/medical-counseling-services/counseling/crisis-intervention/>
- Report a Concern: <http://health.rutgers.edu/do-something-to-help/>
- Violence Prevention & Victim Assistance (VPVA)
(848) 932-1181 / 3 Bartlett Street, New Brunswick, NJ 08901 / www.vpva.rutgers.edu/
The Office for Violence Prevention and Victim Assistance provides confidential crisis intervention, counseling and advocacy for victims of sexual and relationship violence and stalking to students, staff and faculty. To reach staff during office hours when the university is open or to reach an advocate after hours, call 848-932-1181.
- Disability Services
(848) 445-6800 / Lucy Stone Hall, Suite A145, Livingston Campus, 54 Joyce Kilmer Avenue, Piscataway, NJ 08854 / <https://ods.rutgers.edu/>
Rutgers University welcomes students with disabilities into all of the University's educational programs. In order to receive consideration for reasonable accommodations, a student with a disability must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation: <https://ods.rutgers.edu/students/documentation-guidelines>. If the documentation supports your request for reasonable accommodations, your campus's disability services office will provide you with a Letter of Accommodations. Please share this letter with your instructors and discuss the accommodations with them as early in your courses as possible. To begin this process, please complete the Registration form on the ODS web site at: <https://ods.rutgers.edu/students/registration-form>.