

CS5242 : Neural Networks and Deep Learning

Administrative (Week 1)

Semester 1 2021/22

Xavier Bresson

<https://twitter.com/xbresson>

Department of Computer Science
National University of Singapore (NUS)



About Me



Xavier Bresson
xavier@nus.edu.sg

- Prof of Computer Science at NUS, Singapore
- Undergraduate in France, PhD at EPFL, Switzerland, Postdoctorate at UCLA, US
- Leading researcher in Deep Learning on Graphs
- 2.5M US\$ NRF Fellowship on new DL techniques
- Speaker at NeurIPS, ICML, ICLR, CVPR, SIAM, KDD
- Teach Bachelor, Master, PhD courses in DS and DL since 2015 at UCLA, EPFL, NTU, NYU
- Consulting & training for companies

-  <https://twitter.com/xbresson>
-  <https://scholar.google.com/citations?user=9pSK04MAAAAJ>
-  https://www.youtube.com/channel/UCeONAtqVKCS30Xn6zy1YQ_g
-  <https://github.com/xbresson>
-  <https://www.linkedin.com/in/xavier-bresson-738585b>
-  <https://www.facebook.com/xavier.bresson.1>
-  <https://graphdeeplearning.github.io>
-  <http://www.ntu.edu.sg/home/xbresson>

Students



CS5242 Class Logistics

- Class Schedule
 - Lectures+Tutorials : 3 hours on Tuesdays 6:30pm-9:30.
 - Zoom : <https://nus-sg.zoom.us/j/82505991629?pwd=cEJMZWpsTldnbWplWXhzVHhMQ2ZCdz09>
- Material
 - Admin : LumiNUS <https://luminus.nus.edu.sg/modules/33000da0-6a3a-49e2-8484-56fdf735d8cd>
 - Slides/video recordings :
<https://drive.google.com/drive/folders/1LJeeG4CQ4MeaNvt5fAXPkKYKxaWEINx>

Note: I reserve the right to change the slides until the lecture.
 - Python notebooks : https://github.com/xbresson/CS5242_2021

Note: You will need to a Gmail account to use Google Colab.



A screenshot of the LumiNUS module page for "Neural Networks and Deep Learning". The page shows the module code (CS5242), title, and various sections like "Module Overview", "Teaching Staff", "Assessments", and "Contact Details". A schedule table is visible on the right side.

A screenshot of a Google Drive folder named "CS5242". It contains several files: "course_overview.pdf", "lecture1_introduction.pdf", "lecture1_recitation.pdf", and "lecture1_slides.pdf". The folder was last modified on 12/12/2020 at 11:49 AM.

A screenshot of a GitHub repository named "CS5242_2021". The repository description is "Neural Networks and Deep Learning, NUS CS5242, 2021". It shows the repository structure with files like "code", "grader", "lab", "lectures", "README.md", "environment.yml", and "MANIFEST.in". The repository has 22 commits and 22 contributors.

CS5242 Communication

- Questions
 - Before class: Use the Forum in LumiNUS to ask questions (I will answer some of them during the class).
 - During class: Ask me questions during zoom lecture/tutorial with chat box or microphone.
 - After class: Ask questions to TAs during zoom office hours (starting week 2).
- Emails
 - Please, ask TAs first.
 - I will not usually answer individual emails.
- Forum
 - Use Forum in LumiNUS to ask questions to your peers (not only me and TAs).

A screenshot of the LumiNUS platform's faculty page. It displays a grid of faculty profiles. Each profile includes a small photo, the name, title, and email address. The faculty listed are:

- Xavier Bresson (Lecturer, Email: xbresson@nus.edu.sg)
- GOH YONG LIUNG (Manager, Email: xl14448@nus.edu)
- WANG GUANGZHI (Teaching Assistant, Email: xl14712@nus.edu)
- HU SIRU (Teaching Assistant, Email: xl14713@nus.edu)
- WU ZHADIN (Teaching Assistant, Email: xl14715@nus.edu)
- LAI Hengfei (Teaching Assistant, Email: xl14716@nus.edu)
- FU Xiqian (Teaching Assistant, Email: xl14717@nus.edu)

A screenshot of the LumiNUS platform's forum page. The left sidebar shows navigation links for "Natural Networks and Deep Learning", "Class & Script", "Announcements", "Chat Room", "Glossary", "Consultation", "File", and "Forum". The main content area shows a list of forum threads under the "Forum" category. Threads include "Lecture Tutorial", "Assignment 1 Due 10/10/2018", "Assignment 2 Due 10/10/2018", and "Midterm Exam". A search bar is visible at the top right.

Teaching Assistants

- Teaching Assistants :
 - Mr Goh Yong Liang, gyl@u.nus.edu
 - Mr Wang Guangzhi, guangzhi.wang@u.nus.edu
 - Mr Hu Sixu, husixu@u.nus.edu
 - Mr Wu Zhaomin, zhaomin@u.nus.edu
 - Mr Liu Hongfu, e0673183@u.nus.edu
 - Mr Fu Yujian, e0427770@u.nus.edu

Description	Facilitators	Readings	Weblinks	Timetable	Library Resources
Only owners and co-owners are allowed to add, modify and delete facilitators.					
 Xavier Bresson Owner Email: xavier@nus.edu.sg ...	 GOH YONG LIANG Manager Email: e0146498@u.nus.edu ...				
 WANG GUANGZHI Manager Email: e0517241@u.nus.edu ...	 HU SIXU Manager Email: e0409758@u.nus.edu ...				
 WU ZHAOMIN Manager Email: e0409765@u.nus.edu ...	 Liu Hongfu Manager Email: e0673183@u.nus.edu ...				
 FU YUJIAN Manager Email: e0427770@u.nus.edu ...					

- Please, be considerate and respectful with the Teaching Assistants.

Teaching Assistants

- Zoom office hour (1 hour for each TA) :
 - Weeks 2-7 (recess week included)
 - Every xx xxpm-xx : Mr xxx, zoom : xxx
 - Every xx xxpm-xx : Mr xxx, zoom : xxx
 - Every xx xxpm-xx : Mr xxx, zoom : xxx
 - Weeks 8-13
 - Every xx xxpm-xx : Mr xxx, zoom : xxx
 - Every xx xxpm-xx : Mr xxx, zoom : xxx
 - Every xx xxpm-xx : Mr xxx, zoom : xxx

Description	Facilitators	Readings	Weblinks	Timetable	Library Resources
Only owners and co-owners are allowed to add, modify and delete facilitators.					
	Xavier Bresson Owner Email: xavier@nus.edu.sg Lecturer		GOH YONG LIANG Manager Email: e0146498@u.nus.edu Teaching Assistant		
	WANG GUANGZHI Manager Email: e0517241@u.nus.edu Teaching Assistant		HU SIXU Manager Email: e0409758@u.nus.edu Teaching Assistant		
	WU ZHAOMIN Manager Email: e0409765@u.nus.edu Teaching Assistant		Liu Hongfu Manager Email: e0673183@u.nus.edu Teaching Assistant		
	FU YUJIAN Manager Email: e0427770@u.nus.edu Teaching Assistant				

Tentative Schedule

Week	Topic	Assessment
1	Introduction	
2	Vanilla NNs - Part 1	
3	Vanilla NNs - Part 2	
4	MLP - Part 1	
5	MLP - Part 2	
6	CNNs - Part 1	Quiz 1
Recess		
7	CNNs - Part 2	Coding test 1
8	RNNs - Part 1	
9	RNNs - Part 2	Quiz 2
10	ANNs - Part 1	
11	ANNs - Part 2	Coding test 2
12	Conclusion	
13		Project delivery

NNs = Neural Networks

MLP = Multi-Layer Perceptron

CNNs = Convolutional Neural Networks

RNNs = Recurrent Neural Networks

ANNs = Attention Neural Networks

CS5242 Evaluation

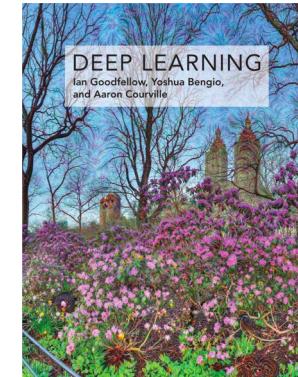
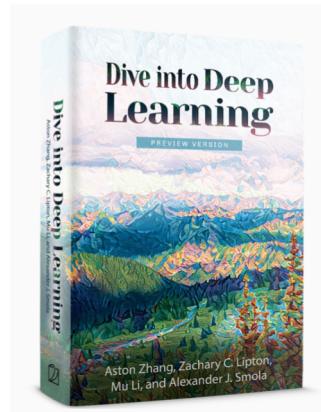
- This module is 100% CA, i.e., there is no final exam.
- There are 3 components:
 - 2 quizzes, each 15% (Weeks 6 & 9). The quizzes are individual. There is no makeup quiz. The weight of quizzes is 30% in total.
 - 2 coding tests, each 20% (Weeks 7 & 11). The coding tests are individual. Check the schedule for the date of each coding test. There is no makeup coding test. The weight of quizzes is 40% in total.
 - 1 group project, 30% (Week 13). Check the schedule for the date of the project delivery. The project is group-based with a group size of at most 3. Choose your group wisely -- each teammate must contribute equally to the project. Each project will deliver a python notebook with the code and the description of the project (in Markdown), and a short video presentation (each student will present her/his contribution to the project).

Learning Outcomes

- At the end of this semester, students should be able to
 - Explain the principles different layers and training algorithms.
 - Compare different neural network architectures.
 - Identify and apply deep learning techniques to different data problems.
 - Implement popular neural networks and training algorithms (with PyTorch).
 - Analyze and solve real-world problems using neural networks.
- Short-term goal : Learn how to apply the current most powerful data analysis tools.
- Long-term goal : Data scientists/deep learning experts have become one of the most-wanted jobs in industry.

Reference Books

- Available online :
 - Ian Goodfellow, Yoshua Bengio, Aaron Courville, Deep Learning, <https://www.deeplearningbook.org>
 - Aston Zhang, Zack C. Lipton, Mu Li, Alex J. Smola, Dive into Deep Learning, <https://d2l.ai>





Questions?