



M2177.003100

Deep Learning

[0: Class Introduction]

Electrical and Computer Engineering
Seoul National University

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(last compiled at 08:02:00 on 2018/09/03)

Class logistics

- time and place

- ▶ 2:00pm–3:15pm, Mon/Wed
- ▶ Room 102, Bldg. 301



- **instructor:** Prof. Sungroh Yoon

- ▶ sryoon@snu.ac.kr
- ▶ office hours (@301-908): TBA



- **teaching assistants:**

Jaehee Jang (head)

Jaeyoon Yoo, Sang-gil Lee

Hyemi Jang, Siwon Kim

- ▶ deeplearning.snu@gmail.com
- ▶ office hours & place: TBA



- course materials: etl.snu.ac.kr
- attendance check
 - ▶ photographs will be taken twice per lecture
 - ▶ you will mark your face on each photo using our website
- class schedule: Google calendar
 - ▶ will be automatically shared with registered students
(email TAs if you do not see the calendar)

Sun	Mon	Tue	Wed	Thu	Fri	Sat
27	28	29	30	31	Sep 1	2
	3	4 2p 청구수업	5	6 2p 청구수업	7	8
10	11 2p 청구수업	12 7p 흐교세션 (Tens)	13 2p 청구수업	14	15	16
17	18 Project 1 mid 2p 청구수업	19 7p 흐교세션 (Proj)	20 2p 청구수업	21	22	23
24	25 2p 청구수업	26 7p 흐교세션	27 2p 청구수업	28	29	30

Class objectives

- main objectives:
 - ▶ understand fundamentals of deep learning
 - ▶ have hands-on experience
 - ▶ motivate to learn recent breakthroughs in AI & deep learning



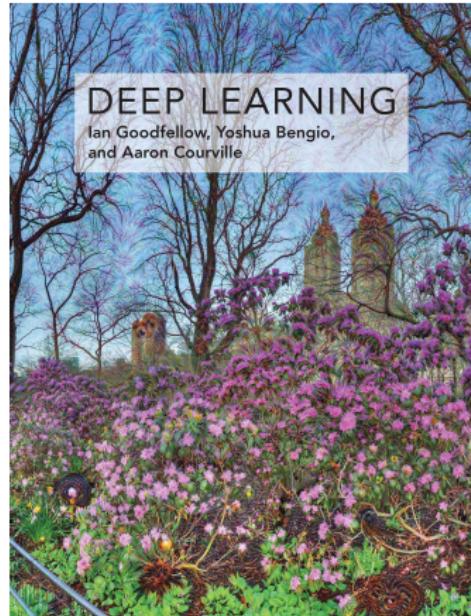
Prerequisites

- this class:
 - ▶ intended to be the first course in deep learning
 - ▶ but NOT be the first course in machine learning
- recommended prerequisites
 - ▶ basic machine learning
 - ▶ familiarity with programming
 - ▶ a basic understanding of computational performance issues
 - ▶ calculus, probability theory & linear algebra
 - ▶ some of the terminology of graph theory

Textbook

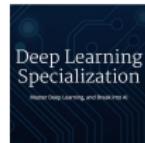
- *Deep Learning*

- ▶ by Goodfellow, Bengio, and Courville
- ▶ website: [▶ Link](#)
- ▶ hardcopy available at SNU bookstore



References

- *Pattern Recognition and Machine Learning*
 - ▶ by Bishop
 - ▶ general reference
- *Convolutional Neural Networks for Visual Recognition*
 - ▶ by Li, Johnson, and Yeung (Stanford CS231n)
 - ▶ website: [▶ Link](#)
- *Reinforcement Learning*
 - ▶ by Sutton and Barto (2nd edition): [▶ Link](#)
 - ▶ lectures (D. Silver): [▶ Link](#)
- *Deep Learning Specialization*
 - ▶ Coursera: [▶ Link](#)



Software library

- TensorFlow [▶ Link](#)

- ▶ an open-source software library for machine intelligence
- ▶ all programming projects should be done using TensorFlow
- ▶ TAs will offer tutorial sessions



Syllabus (tentative)

Part I: foundations

- 1 introduction + α (GBC 1-4)
- 2 machine learning basics (GBC 5)

Part II: modern practical deep nets

- 1 deep feedforward nets (GBC 6)
- 2 regularization (GBC 7)
- 3 optimization (GBC 8)
- 4 convolutional nets (GBC 9)
- 5 recurrent nets (GBC 10)
- § midterm (10/22 or 10/24)

Part III: deep learning research

- 1 autoencoders (GBC 14)
- 2 deep generative models (GBC 20)
- 3 reinforcement learning (SB)

Part IV: recent topics

- 1 autonomous vehicle (project)
- 2 topic(s) of your choice (poll)
- § final exam (12/3)

GBC: Goodfellow, Bengio & Courville
SB: Sutton & Barto

Programming projects

- schedule

#	topic	TA	out	due	
P0	Python + TensorFlow	Jaehee	9/3	9/17	2 wks
P1	MLP	Siwon	9/10	10/1	3 wks
P2	CNN	Siwon	9/24	10/15	3 wks
P3	RNN	Sang-gil	10/15	10/29	2 wks
P4	GAN	Jaeyoon	10/29	11/12	2 wks
P5	RL	Hyemi	11/12	11/26	2 wks
final	Autonomous driving	Jaehee	11/19	12/9	3 wks

- notes

- ▶ team project (**two** students per team; no more/no fewer)
- ▶ Jupyter Notebook will be provided for each project
- ▶ each project: due at **11:59pm** on due date
- ▶ P0–P5 will be lightly graded (but will be covered by midterm/final exam)

To encourage student participation

- what topic do you want to learn other than those in syllabus?
 - ▶ will poll soon and let you know next week
 - ▶ approximately 2 lectures will cover the most wanted topics
- final project competition: TORCS
 - ▶ a series of tournaments at 2pm on 12/10/Mon (make sure to be there!)



Important dates

- **NO ADJUSTMENT POSSIBLE**
 - ▶ you are advised not to take this class if you cannot make it
- three make-up classes
 - ▶ 7pm on 9/6/Thurs (301-102)
 - ▶ 7pm on 9/11/Tues (place TBA)
 - ▶ 7pm on 11/8/Thurs (place TBA)
- TA sessions (301-102, unless otherwise noted):
 - ▶ 7pm on {9/4, 9/18}, {10/2, 10/16, 10/30}, {11/13}
- exams
 - ▶ **midterm:** 2pm on 10/22/Mon or 10/24/Wed (place TBA)
 - ▶ **final exam:** 2pm on 12/3/Mon (place TBA)
- final project competition: 2pm on 12/10/Mon (301-102)
- regular classes on some holidays: **10/3 and 10/15**

Schedule: September

September	3 2pm class <i>(P0 out)</i>	4 7pm session <i>(P0 intro)</i>	5 2pm class	6 7pm make-up		
	10 2pm class <i>(P1 out)</i>	11 7pm make-up	12 2pm class			
	17 2pm class <i>(P0 due)</i>	18 7pm session <i>(P1 intro)</i>	19 2pm class			
	24 no class <i>(P2 out)</i>		26 no class			

Schedule: October

October	1 2pm class (P1 due)	2 7pm session (P2 intro)	3 2pm class			
	8 2pm class		10 2pm class			
	15 2pm class (P2 due) (P3 out)	16 7pm session (P3 intro)	17 2pm class			
	22 2pm class (midterm)		24 2pm class (midterm)			
	29 2pm class (P3 due) (P4 out)	30 7pm session (P4 intro)	31 2pm class			

Schedule: November

November	5 2pm class		7 no class	8 7pm make-up		
	12 2pm class (P4 due) (P5 out)	13 7pm session (P5 intro)	14 2pm class			
	19 2pm class (Final P out)		21 2pm class (Final P intro)			
	26 2pm class (P5 due)		28 2pm class			

Schedule: December

December	3 2pm final exam		5 2pm class (project Q&A)			
9 11:59pm final project due	10 2pm class (tournament)					



Performance evaluation

- programming projects (20%): team of two students
 - ▶ P0 (1%) + P1 (3%) + P2–P5 (4% each)
 - ▶ projects will be lightly graded (but will be covered by midterm/final)
- midterm (25%)
 - ▶ 2pm on either 10/22/Mon or 10/24/Wed
- final exam (25%)
 - ▶ 2pm on 12/3/Mon
- final project (25%): team of two students
 - ▶ out: 11/19/Mon
 - ▶ due: 11:59pm on 12/9/Sun
 - ▶ competition: 2pm on 12/10/Mon
- class attendance (5+%)

Final remarks

- pick a **partner** for your projects not too late
 - ▶ let the teaching staff know if you need help
- don't forget to **poll**: a topic of your choice
 - ▶ a link for online poll will be sent out soon
- **absolutely no negotiation for your final grades!**

Schedule

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	10 2pm class (P1 out)	11 7pm make-up	12 2pm class			
	17 2pm class (P0 due)	18 7pm session (P1 intro)	19 2pm class			
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	15 2pm class (P2 due) (P3 out)	16 7pm session (P3 intro)	17 2pm class			
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	29 2pm class (P3 due) (P4 out)	30 7pm session (P4 intro)	31 2pm class			

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