SYDE 556/750
Simulating Neurobiological Systems
Lecture 0: Administrative Remarks

Andreas Stöckel

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UNIVERSITY OF
WATERLOO | **FACULTY OF ENGINEERING**

Organization (I)

Instructor

Andreas Stöckel

Office	E7-6342 (office hours in E7-6323)
Email	astoecke@uwaterloo.ca
Website	http://compneuro.uwaterloo.ca/people/andreas-stoeckel.html
GitHub	https://github.com/astoeckel

Course website

- ▶ http://compneuro.uwaterloo.ca/courses/syde-750.html
- ▶ https://github.com/astoeckel/syde556-w20

Organization (II)

Course times and location

- **Tuesday:**
  11:30-12:50 in **E5-4106** (SYDE 556/750)
- **Thursday:**
  9:00-10:20 in **E5-6004** (SYDE 556/750)
- **Thursday:**
 10:30-11:20 in **E5-6127** (SYDE 750, optional for 556)

Office hours

- Office hours are generally in E7-6323.
- Potential times:
  Tue 13:00-14:00, Tue 15:00-16:00, Thu 11:30-12:30, Fri 10:30-11:30
- Alternatively, if that time doesn't work for you, by appointment.

Textbooks and Readings
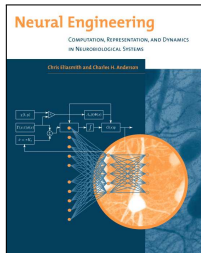
Main text:
Chris Eliasmith and
Charles H. Anderson
*Neural Engineering:
Computation,
Representation, and
Dynamics in Neurobiological
Systems*, MIT Press, 2003.
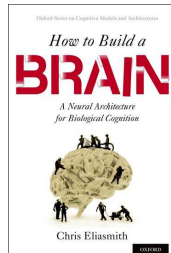
Optional:
Chris Eliasmith
How to Build a Brain,
Oxford University Press,
2013.

Coursework (SYDE 556 & SYDE 750)

Four Assignments (60% of the mark)

- ▶ 20%, 20%, 10%, 10%, respectively
- ▶ Roughly two weeks for each assignment
- ▶ Everyone must write their own code, generate their own graphs, and write their own answers.

Final Project (40% of the mark)

- ▶ Build a model of some neural system.
- ▶ For 556 students: extension of something seen in class
- ▶ For 750 students: research project with more novelty
- ▶ Have your project approved via email before Reading Week!

Coursework (SYDE 750 only)

Class Participation in the Seminar (SYDE 750 only; optional for SYDE 556)

▶ SYDE 750 students must attend the seminar (Thursday, 10:30-11:20 in E5-6127).

▶ Each student is asked to submit (at least) three questions or interesting observations pertaining this week's reading, lecture notes, or the material referenced in the lecture (this should be about 100 words).

▶ Questions must be submitted via email to the instructor (astoecke@uwaterloo.ca) by midnight (23:59 EST) on the Wednesday before.

▶ This is to ensure a lively discussion in the seminar — there are no marks for this part of the course.

Schedule (I)

Date	Reading	Topic	Assignments
WEEK 1			
Jan 7	Chapter 1	Introduction	
Jan 9	Chapter 2	Neurons	
WEEK 2			
Jan 14	Chapter 2	Population Representation (I)	#1 posted
Jan 16	Chapter 2	Population Representation (II)	
WEEK 3			
Jan 21	Chapter 4	Temporal Representation (I)	
Jan 23	Chapter 4	Temporal Representation (II)	
WEEK 4			
Jan 28	Chapters 5, 6	Feedforward Transformations (I)	#1 due*, #2 posted
Jan 30	Chapters 5, 6	Feedforward Transformations (II)	
WEEK 5			
Feb 4	Chapter 8	Dynamics (I)	
Feb 6	Chapter 8	Dynamics (II)	

Schedule (II)

Date	Reading	Topic	Assignments
WEEK 6			
Feb 11	Chapter 7	Analysis of Representation	#2 due*, #3 posted
Feb 13	*provided*	Temporal Basis Functions	
Feb 14			Project proposal due
WEEK 7		*— Reading week, no lectures —*	
WEEK 8			
Feb 25	*provided*	Symbols (I)	
Feb 27	*provided*	Symbols (II)	
WEEK 9			
Mar 3	Chapter 8	Memory	#3 due*, #4 posted
Mar 5	*provided*	Action Selection	
WEEK 10			
Mar 10	Chaper 9	Learning (I)	
Mar 12	Chaper 9	Learning (II)	

Schedule (III)

Date	Reading	Topic	Assignments
WEEK 11			
Mar 17	*provided*	Spatial Semantic Pointers	#4 due*
Mar 19	*provided*	Biological Details	
WEEK 12			
Mar 24	*provided*	Other modelling frameworks	
Apr 2		Conclusion	
WEEK 13			
Mar 31, Apr 2		Project presentations	
WEEK 15			
Apr 15			Projects due*

* The project and all assignments are due at midnight ($\approx$ 11:59p EST) of that day.

Homework

- **Get the** `textbook` **, read the first chapter**
  ("Neural Engineering", Chris Eliasmith and Charles Anderson, 2003)

- **Be able to run** `jupyter lab` **or (** `jupyter notebook` **) with** `Python 3`
  Install `numpy`, `scipy`, and `matplotlib`. You may want to use Anaconda, which
  ships with these packets preinstalled.

- Have a look at the `course website` and the `lecture notes`.

- `For SYDE 750`: write down three questions and submit before Thursday

- Start thinking about a `project` . . . already.