

# Introduction to computer science

## GIGA Doctorate School

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## Who am I?

- ▶ Master in Electrical Engineering and Ph.D. in Engineering
- ▶ FRS-FNRS Research Director
- ▶ Research and interest in “neuroimaging methods”  
→ data processing of brain images (MRI and PET) and  
electro-physiological data (M/EEG)
- ▶ Linked to:
  - GIGA *in silico* medicine & CRC *in vivo* imaging research units
  - Department of Electrical Engineering & Computer Science



# Who are you ?

- ▶ Background
- ▶ Programming experience?

# Course program



- ▶ Check <https://indico.giga.uliege.be/event/335/> for the slides

| THURSDAY, 6 OCTOBER |   |                |
|---------------------|---|----------------|
| 09:30 → 10:00       | <b>Welcome + Introduction to computer science : historical perspective, computer structure, operating systems &amp; languages</b><br>Speaker: Prof. Christophe Phillips (GIGA in silico medicine & CRC in vivo imaging) | 🕒 30m          |
| 10:00 → 11:00       | <b>Data representation &amp; storage: bits/bytes, data format, signal discretization, compression</b><br>Speaker: Dr Mohamed Bahri  | 🕒 1h           |
| 11:00 → 11:30       | <b>Coffee break</b>   | 🕒 30m          |
| 11:30 → 12:00       | <b>ULiège IT resources by the SeGI/UDI's</b><br>Speaker: Mr Yves Wesche   | 🕒 30m  Minutes |
| 12:00 → 12:30       | <b>GIGA-ULiège Mass storage</b><br>Speaker: David Stern   | 🕒 30m          |
| 12:30 → 13:30       | <b>Lunch break</b>  | 🕒 1h           |
| 13:30 → 14:30       | <b>Access to and use of the mass storage</b><br>Speaker: Dr Alice Mayer   | 🕒 1h           |
| 14:30 → 15:00       | <b>Coffee break</b>   | 🕒 30m          |
| 15:00 → 17:00       | <b>Matlab &amp; Octave practical</b><br>See the 'minutes' for the program<br>Speakers: Prof. Christophe Phillips (GIGA in silico medicine & CRC in vivo imaging) , Dr Mohamed Bahri                                     | 🕒 2h           |



MONDAY, 10 OCTOBER



**09:30** → 10:30 **Introduction to algorithmic thinking: Different types of algorithms, computer logic.** ⌚ 1h

**Speaker:** Dr Mohamed Bahri

**10:30** → 11:00 **Coffee break** ⌚ 30m

**11:00** → 12:00 **Code versioning & Git, an introduction.** ⌚ 1h

**Speaker:** Prof. Christophe Phillips (GIGA in silico medicine & CRC in vivo imaging)

**12:00** → 13:00 **Lunch break** ⌚ 1h

**13:00** → 15:00 **GitHub/Gitlab account hands-on check and explanations** ⌚ 2h **Minutes**

**Speakers:** Dr Grégory Hammad (GIGA-CRC in vivo imaging) , Martin Grignard

**15:00** → 15:30 **Coffee break** ⌚ 30m

**15:30** → 17:30 **Matlab & Octave practical** ⌚ 2h

See the 'minutes' for the program

**Speakers:** Prof. Christophe Phillips (GIGA in silico medicine & CRC in vivo imaging) , Dr Mohamed Bahri



MONDAY, 17 OCTOBER



09:30

→ 10:30

**Good practices in scientific computing: Code modularity, validation, optimization, documentation**

🕒 1h



**Speaker:** Prof. Christophe Phillips (GIGA in silico medicine & CRC in vivo imaging)

10:30

→ 11:00

Coffee break

🕒 30m

11:00

→ 13:00

**Working with High Performance Computing Clusters & parallel processing (including hands-on on GIGA cluster).**

🕒 2h



**Speaker:** Dr Alice Mayer

13:00

→ 14:00

Lunch break

🕒 1h

14:00

→ 15:00

**Research Data Management and Reproducibility: good habits for good research**

🕒 1h

📄 Minutes



**Speaker:** Dr Judith Biernaux (ARD ULiege)

15:00

→ 15:30

Coffee break

🕒 30m

15:30

→ 17:30

**Matlab & Octave practical**

🕒 2h



See the 'minutes' for the program

**Speakers:** Prof. Christophe Phillips (GIGA in silico medicine & CRC in vivo imaging) , Dr Mohamed Bahri



MONDAY, 24 OCTOBER



|       |         |   |             |           |   |
|-------|---------|---|-------------|-----------|---|
| 09:30 | → 10:30 | <b>Working with personal data ? Think GDPR!</b><br>Speaker: Mr Pierre-François Pirlet   | 🕒 1h        | 📄 Minutes | ✎ |
| 10:30 | → 11:00 | Coffee break  | 🕒 30m       |           |   |
| 11:00 | → 12:15 | <b>Data processing in genomics, from the sequencers to the results: data management, pipelines and containers, reproductibility.</b><br>Speaker: Dr Arnaud Lavergne | 🕒 1h<br>15m |           | ✎ |
| 12:15 | → 13:15 | Lunch break   | 🕒 1h        |           |   |
| 13:15 | → 15:15 | <b>Matlab &amp; Octave practical</b><br>Speakers: Prof. Christophe Phillips (GIGA in silico medicine & CRC in vivo imaging) , Dr Mohamed Bahri                      | 🕒 2h        |           | ✎ |
| 15:15 | → 15:45 | Coffee break  | 🕒 30m       |           |   |
| 15:45 | → 16:00 | <b>Closing comments + Q&amp;A</b><br>Speakers: Prof. Christophe Phillips (GIGA in silico medicine & CRC in vivo imaging) , Dr Mohamed Bahri                         | 🕒 15m       |           | ✎ |



Let's go!



