Kick-off Meeting

Winter Semester 2022/2023

Saarland University
Chair for Clinical Bioinformatics

29th November, 2022

HIPS

CHAIR FOR CLINICAL BIOINFORMATICS
SAARLAND UNIVERSITY

Welcome

Thanks for enrolling!

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General information

How to pass the courses

Certificate requirements:

1) Successful presentation:
   - Talk: **30 minutes** for a proseminar and **40 minutes** for a seminar (large deviations in either direction negatively affect the grade)
   - Discussion: at least **5 minutes** during which you should be able to answer questions from the tutors and the audience (it is highly recommended to ask questions)
2) Attendance to all presentations is **mandatory**
3) Submitting a summary report:
   - Short description / summary of the topic you presented
   - Main structure: title (page), main text (with or without subsections), references
   - Only include relevant figures, tables or formulas
   - Ca. **2 pages** of pure text, excluding title (page), figures, table, references, etc.
   - It is recommended to write the report using LaTeX to train scientific writing

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Grading

Final grade:

- Primarily based on the given presentation & follow-up discussion
- Might be influenced by the quality of the submitted summary report

For clarification:

	Study program	Credit points
Proseminar	Bachelor's only	5CPs - graded
Seminar	Master's only	7CPs - graded

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Pro- / Seminar: Computational Methods for Spatial Transcriptomics

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About this course

What are we looking at?

- assay based spatial transcriptomics data (e.g. Visium): images + sequences
- methods (to analyze and process the spatially barcoded transcripts)

What are we interested in?

- **What genes** are expressed at which location (preprocessing, QC,...)
- How do we find **spatially variable** genes and regions?
- **What cell types** are present at which location (deconvolution, annotation)?
- How do **cells communicate** (cell-cell communication networks)?

What are the main methods used?

- Bayesian models: Deconvolution
- Machine Learning (e.g. autoencoders): Spatial domains, deconvolution
- Statistical tests: Spatial patterns
- Optimization: Sample alignment

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Distributed Topics

Student	Topic	
Leen Ajjan Alhadid	1)	Spatial Multi-Omic Map of Human Myocardial Infarction
-	2)	-
Sili Vettiyara Sunil	3)	Spatial transcriptomics at subspot resolution with BayesSpace
Alaa Bakry	4)	Cell2location Maps Fine-Grained Cell Types in Spatial Transcriptomics
Ali Hassan	5)	Deep Learning and Alignment of Spatially Resolved Single-Cell Transcriptomes with Tangram
-	6)	-
Midhuna I. Joseph Maran	7)	Statistical Analysis of Spatial Expression Patterns for Spatially Resolved Transcriptomic Studies
Amila Beganovic	8)	Alignment and integration of spatial transcriptomics data
Tobias Wolff	9)	Deciphering Spatial Domains from Spatially Resolved Transcriptomics with an Adaptive Graph Attention Auto-Encoder
Ritika Bansal	10)	Knowledge-graph-based cell-cell communication inference for spatially resolved transcriptomic data with SpaTalk

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Course Schedule

Event	Time	Comments
Registration Deadline	November 20, 2022	-
Kick-off meeting (mandatory)	Today	Remote
Deadline to register in HISPOS **or** de-register from seminar (mandatory)	December 20, 2022	3 weeks after the kick-off meeting
Deadline for feedback (optional)	March 2, 2023	2 weeks before the presentations
Presentations	March 16 and 17, 2023	Place: E2 1, R206
Summary submission deadline (mandatory)	March 24, 2023	1 week after the presentations

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Dos & Don'ts

Dos (How to give a good scientific presentation)

Most importantly:

Practice!

But also:

- Try to reduce the amount of text
  - Prevent showing entire sentences
  - Use figures or visualisations provided by the literature (high resolution, appropriated font size)
  - Add slide numbers
- You should be able to explain everything that is shown on you slides
- Proof-read your slides
- **Ask for feedback** or formulate questions whenever you are stuck (you have the chance to get 2 times feedback from us but only if we receive your slides by email before the deadline on February 19th)
- During your presentation **speak freely**

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Don’ts (How you will not pass the course)

Do not:

- Show formulas that you cannot elaborate further
- Rely only on visualisations from the assigned paper
  - Use e.g. Inkscape to draw own figures or search for further literature (do not forget to reference these)
- Change layouts / formatting too often
- Deviate from you time constraint
- Send us a large list of vague questions
- Ignore our comments on your slides
- Ignore the recommended literature
- Forget to provide references
- Assume a superficial understanding suffices

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Further material and reading

We expect you to:

- Read our presentation guidelines (+ example slides):
  `https://www.ccb.uni-saarland.de/wp-content/uploads/2017/01/guidelines.pdf`
- Work through the presentation checklist before sending us your slides (ignoring it may negatively impact your grade!):
  `https://www.ccb.uni-saarland.de/wp-content/uploads/2014/09/presentation_guidelines.pdf`
- Independently use the available literature to enhance your knowledge on the assigned topic (take a look at our **recommended reading** literature on the course site!)

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