POLYTECHNIQUE
MONTRÉAL

TECHNOLOGICAL
UNIVERSITY

UT TENSIO SIC VIS

INF[67]900E Lecture 1 – Intro
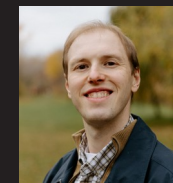
Dr. Bentley Oakes

bentleyjoakes.github.io

This Lecture

1. Course Structure/Plan
2. About Me and About You
3. What is Research and Communication
4. Success in Research and Communication

About the Course

INF6900A(E) and INF7900(E) – Communication scientifique et technique I et II / Scientific and technical communication I and II

Département de Génie informatique et génie logiciel
Fall 2024
1 Crédits
Triplet horaire: 0.5 - 1 - 1.5
moodle.polymtl.ca

Instructor

Name	Lama Seoud / **Bentley Oakes**
Office location	M-3111 / **M-4107**
E-mail	lama.seoud@polymtl.ca / bentley.oakes@polymtl.ca
Availability	By appointment only

Course Description

Communication orale et écrite dans un contexte scientifique ou technique, et plus particulièrement en génie informatique. Éléments importants d'une bonne communication scientifique ou technique. Exposé oral. Évaluation critique d'un article scientifique. Participation aux séminaires départementaux.

Oral and written communication in a scientific or technical context, particularly in computer engineering. Important elements of a good scientific or technical communication. Oral presentation skills. Writing and reviewing scientific or technical documents. Participation in the department's seminars.

Learning Objectives

At the end of the course, the student should be able to:

Objectives
Explain and communicate research ideas effectively in writing and presentations
Organize and deliver scientific presentations
Extract key points of a body of scientific research and present it in a concise manner

Type	Number	Individual / group work	Weight
Google form	1	individually	5%
Paper abstract	1	individually	25%
Critical review (document and peer review)	1	individually	25%
Presentation (slides and oral)	1	individually	25%
Individual participation	1	individually	10%
Group participation	1	group	10%

Explicit evaluation criteria will be provided later

Lecture No.	Date	Theory Topic	Lab Topic	Deliverable due
01	Aug 29th	Introduction	Find research group, present one min pitch	
02	Sept 5th	Reading papers / dissemination	Find topic conferences	
03	Sept 12th	Reviewing papers	Find submission procedures, proceedings, and major paper	
04	Sept 19th	Writing papers	Discuss structure and contributions of one major paper	
05	Sept 26th	Presenting papers	Plan presentations	Abstract due
06	Oct 3rd	Conference structure/procedure	Plan conference order/session chairs/timing	Review
07	Oct 10th	Productivity	Discuss research/publications plans, and productivity strategies	Review peer-review
08	Oct 17th	NO CLASS		
09	Oct 24th	Student Conference		
10	Oct 31st	Student Conference		
11	Nov 7th	Student Conference		
12	Nov 14th	Student Conference		
13	Nov 21st	Student Conference		
14	Nov 28th	Student Conference		Group evaluation

About ChatGPT or other Gen AI tools

This course is about your communication, your unique style, and your unique thoughts

All GenAI tools are forbidden

If GenAI tools are suspected of being used, then the assignment will receive a **mark of zero**

Questions on Course Structure / Content?

?

About Me and You

Lecture Instructor

Professeur responsable et enseignant

Bentley Oakes (Myself)

Assistant Professor at Polytechnique Montréal

bentley.oakes@polymtl.ca
https://bentleyjoakes.github.io/

M-4107
Office hours by appointment

Undergrad
U of Manitoba
2006-2011

1st *stage*
Blackberry (RIM)
Winter 2009

2nd and 3rd *stages*
Electronic Arts
Fall 2009
Summer 2010

M.Sc. and PhD
McGill U
2011-2018

1st post-doc
U of Antwerp
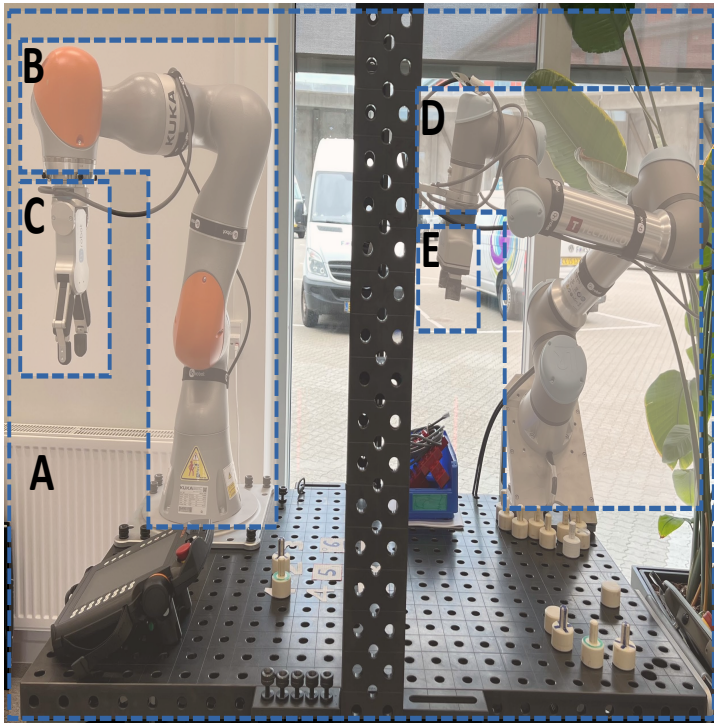2018-2021

2nd post-doc
U of Montreal
2021-2023

Assistant Prof
Polytechnique
2023-present 13
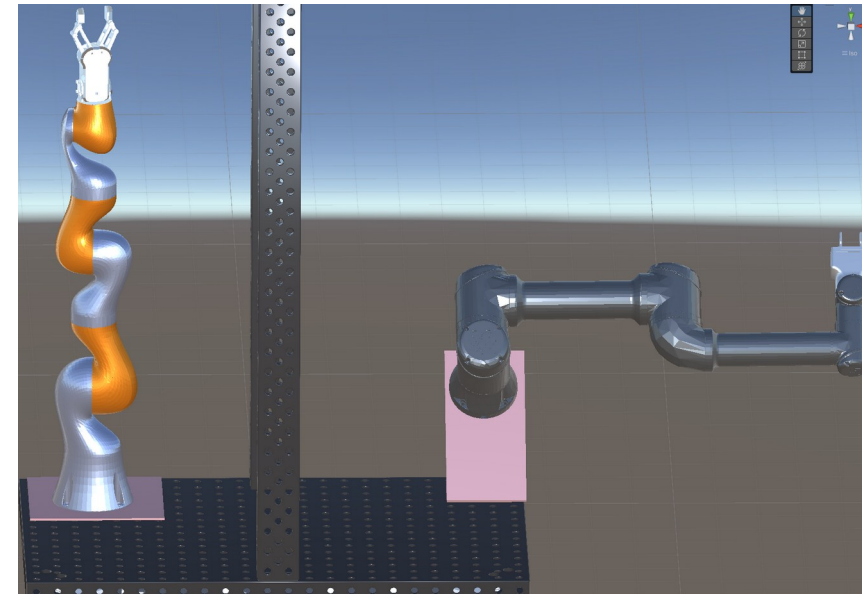
Research Interests

Digital Twin (DT)

dynamic virtual representation of a complex system, for supporting its design and operation

**Robot manufacturing cell**

Physical Twin ⟷ Digital Twin

DT Services:

- Visualize system
- Control the arms and ensure safety
- Anomaly detection
- Find system improvements
- Train users

Digital Twins = Modelling and simulation + multiple domains + real-time data/control + source of truth for services

Research goal:
Accelerate DT engineering,
esp. for non-technical users

➤ Capture domain knowledge with ontologies
➤ Model and measure DT construction process, recommend steps and components
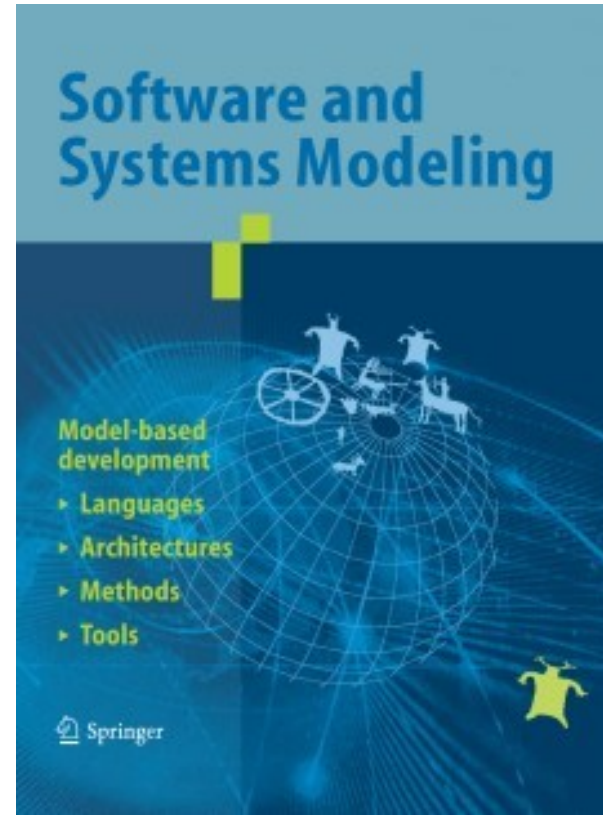➤ Systematic and automated reporting on DT
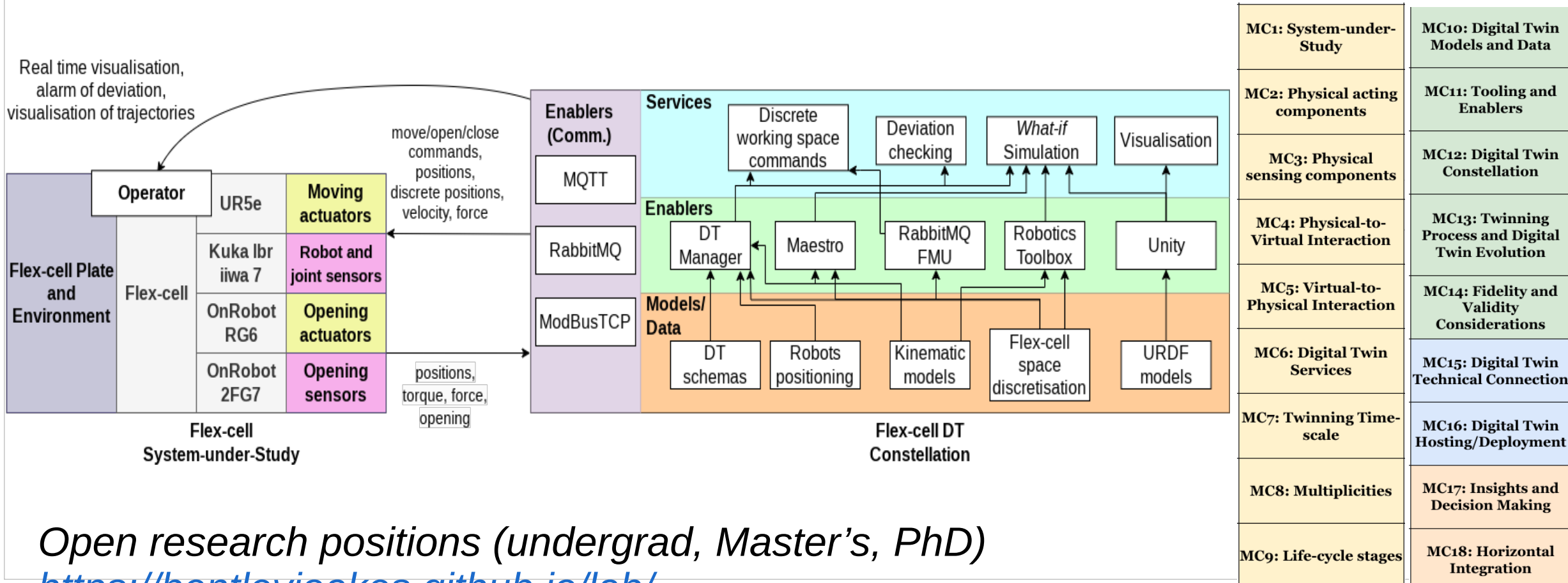
Open research positions (undergrad, Master's, PhD)
https://bentleyjoakes.github.io/lab/

Venues

EDTconf
International Conference on
Engineering Digital Twins

ACM Transactions on
Software Engineering and
Methodology

Software and
Systems Modeling

Model-based
development
▶ Languages
▶ Architectures
▶ Methods
▶ Tools

Springer

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SIMULATION

Transactions of The Society for Modeling and Simulation International

THE SOCIETY FOR
MODELING & SIMULATION
INTERNATIONAL
ISSN 0037-5497
journals.sagepub.com/home/sim

27th International Conference on
Model Driven Engineering Languages and Systems
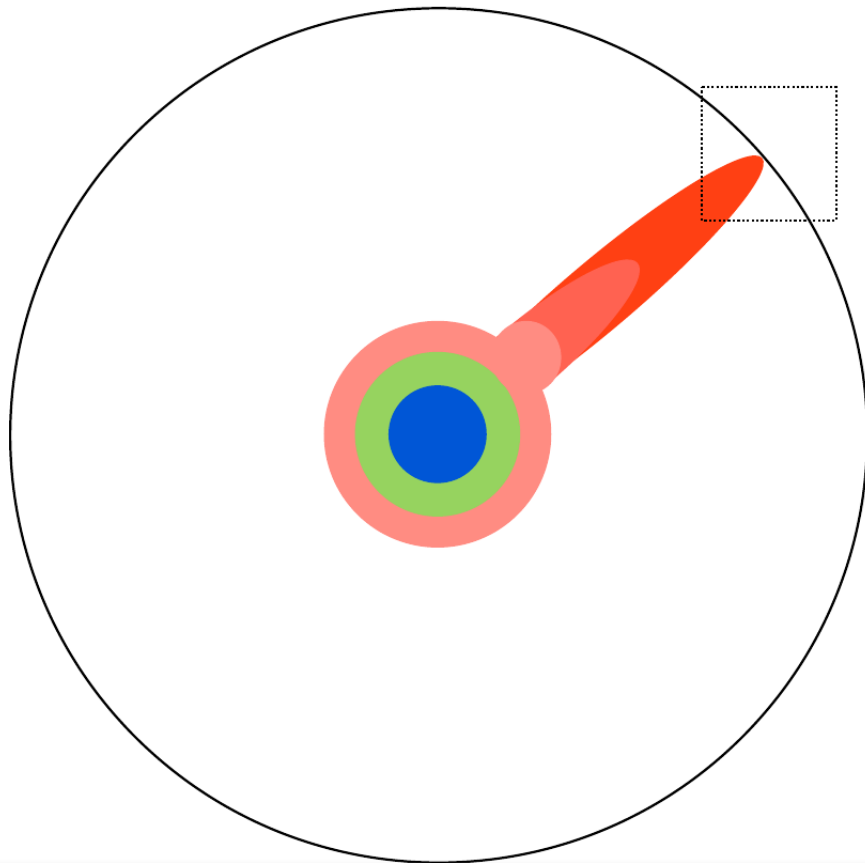
MODELS 24
22 – 27 September 20
Linz , Austria

About You

- Degree and Year
- Have you ___ a paper?
  - Read
  - Reviewed
  - Written
  - Presented

What is Research?

- Research is how we learn about the world
- More precise: Learning about what challenges exist, what has been accomplished, how things work, what methods work to address a challenge...

- For us, it's about recording our observations and predictions to expand the sphere of human knowledge

Sphere of Human Knowledge

http://matt.might.net/
articles/phd-school-in-
pictures/

Scientific and Technical Communication

- We have to share knowledge somehow
  - Speech, text, video...

- Communities benefit from high-quality knowledge sharing
- Nobody wants to waste time repeating work, or reading low-quality papers

Focus on clear, explicit communication

Tailoring Your Message

- Good videos on Moodle about this
- The focus in this course is on scientific communication
- Can also focus on 'public science' for laypeople
- Essential to know who will be in the audience and what they expect
- We must tailor structure/content/style to the audience

Research is Perfomed in a Community

- We have to build on other's work (in both a competitive and cooperative manner)
- Become part of an active and strong community

- "If I have seen further it is by standing on the shoulders of Giants."
  - Isaac Newton

References

We want to be the giants for others
Goals:
Have our work read, discussed, cited

Discoverability is Essential

- In academica, we and our research need to be visible, for:
    - Collaborations
    - Impact (e.g., citations)
    - Invitations for talks/PC/etc.
    - Job applications

    - We need to make it easy for others to know **who we are**, **what research we do**, and how **strong our research is**

How to be Discovered

- Be at seminars/workshops/conferences
  - Attending is important, presenting is better
  - Being on PC (reviewing) is great involvement
  - Organizing (track/poster chair) is even better
  - Know how to summarize your research (elevator pitch)

- Publish in high-quality venues
  - CORE ranking, impact factor

- Maintain an online presence
  - Personal site, academic profiles (Google Scholar etc), social media

Questions About a Researcher

- What do they look like?
- What are their pronouns/name pronunciation?
- What's their email address/institution?
- What's their recent/past work about?
- Who do they publish with?
- What's their # of citations/h-index?

Goal of online visibility:
Make answers to these questions easy to find on your websites/profiles

What is a Successful Paper / Presentation?

- Discussion: What are qualities of a successful paper and presentation?

What is Successful Research?

- Discussion: What are qualities of successful research?

What is a Successful Research Career?

- Discussion: What are qualities of a successful research career?

Lab Session

1. Create (balanced) groups of students, organized by research topic/area
   - Cybersecurity
   - Software Engineering
   - Medical Imaging
   - Robotics
   - AI/ML
   - ...
2. Practice introducing yourself with an elevator pitch of your research

THANK YOU!

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