

Takeaways from My Ph.D. Journey

Ali TOURANI (ali.tourani@uni.lu)

February 2026

Scope

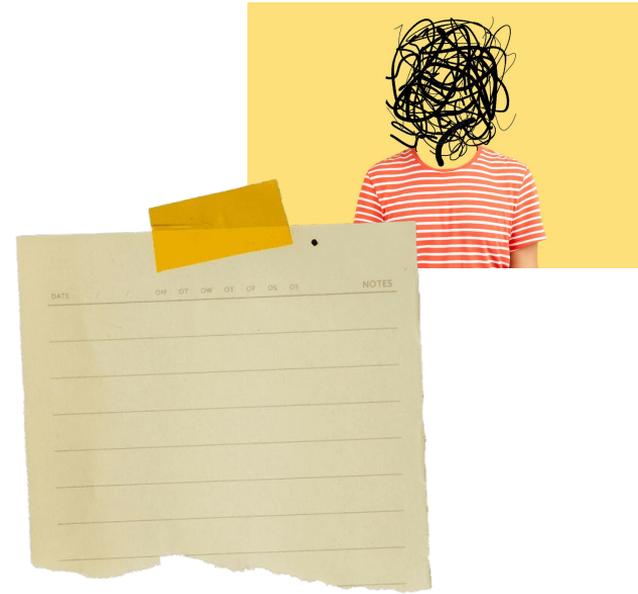


1

Use **Project Management** Tools and Frameworks

Project Management Tools

- **Overwhelming nature** of doing research (mental tasks)
- Typical approaches
 - Keeping everything in your head
 - Daily/Weekly To-Do lists on papers
 - Notes on whiteboards, text files, etc.



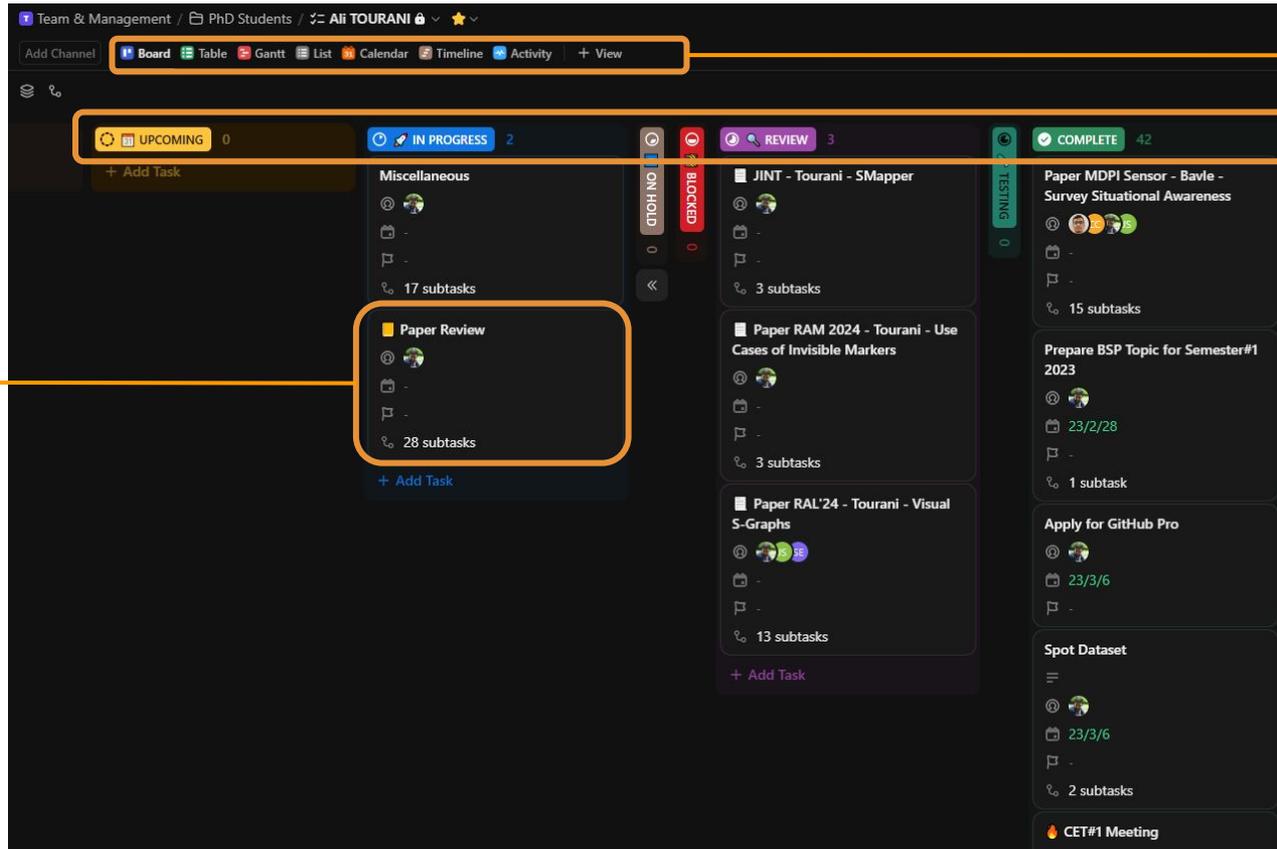
Pros	Cons
<ul style="list-style-type: none">● Low effort to start● Helps in mind offloading● Perfect for brainstorming● No learning curve or setup time	<ul style="list-style-type: none">● Easy to forget / lose● No clear priorities● Hard to track progress overtime● Not scalable for long-term

Project Management Tools

- Structured approaches
 - Cloud-based **Project Management** tools
 - Jira, Clickup, Trello, GitHub projects, ...
 - **[hint]** we have **ClickUp** for free!
 - A **highly-demanded soft skill** in the job market
 - Related Job Titles: Scrum Master, etc.
 - Personal experience: Software Development
- What do they Offer?
 - Kanban / Agile / Scrum boards
 - Providing To Do / Doing / Done states



Project Management Tools



Views

Categories

General task with multiple sub-tasks

Project Management Tools



Team & Management / PhD Students / Ali TOURANI

Task 13

Paper RAL'24 - Tourani - Visual S-Graphs

Ask Brain to write a description, create a summary or find similar tasks

Brain found 1 similar task. Link all Merge all

Status: REVIEW
Dates: Start → Due
Time estimate: Empty
Tags: paper

Assignees: [3 users]
Priority: Empty
Track time: Start

Add description, or write with AI

Custom Fields

Subtasks 12 / 13

Name	Assignee	Priority	Due date
Improved baseline 4	[User]	High	[Due]
Sensors improvement 6	[User]	High	[Due]
Changes of the Architecture 7	[User]	High	[Due]
Code Refactoring 10	[User]	High	[Due]
Bundle Adjustment 2	[User]	High	[Due]

REVIEW 3

JINT - Tourani - SMapper
3 subtasks

Paper RAM 2024 - Tourani - Use Cases of Invisible Markers
3 subtasks

Paper RAL'24 - Tourani - Visual S-Graphs
13 subtasks

COMPLETE 42

Paper MDPI Sensor - Bawle - Survey Situational Awareness
15 subtasks

Prepare BSP Topic for Semester#1 2023
23/2/28
1 subtask

Apply for GitHub Pro
23/3/6

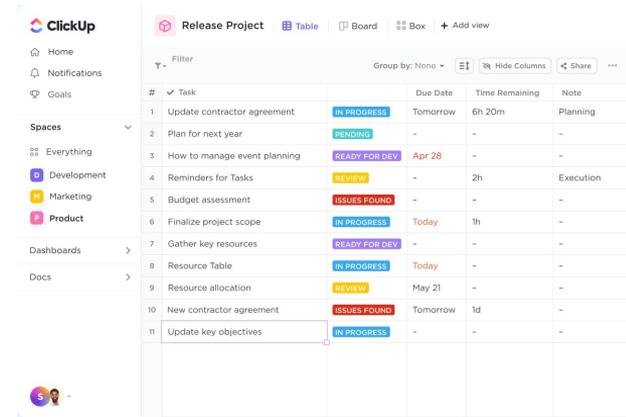
Spot Dataset
23/3/6
2 subtasks

CET#1 Meeting

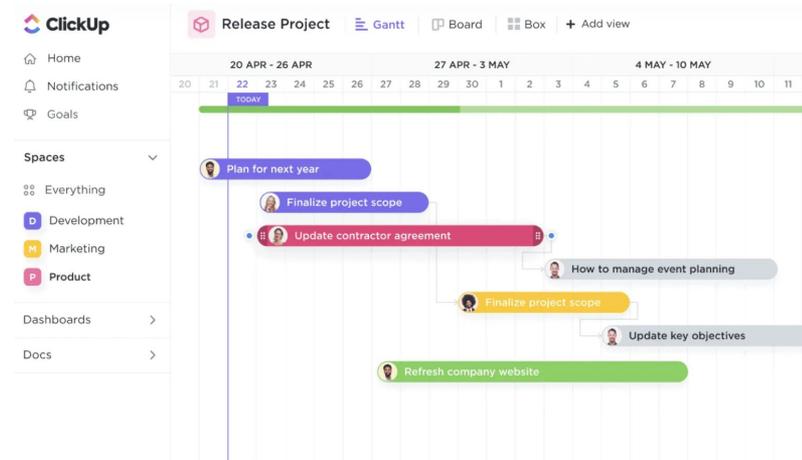
Project Management Tools

- How can they help in project management (like Ph.D.)
 - Clear **visual overview** of the status of your research
 - Breaking the **massive tasks** into manageable small tasks
 - Easy to provide **reports** (e.g., Gantt Chart, Progress Chart, etc.)
 - Helps with **long-term planning** and team collaborations
 - Deadlines
 - Assignments
 - Priorities
 - Monitorings
 - etc.

Interested? Ask Jose Luis for access!



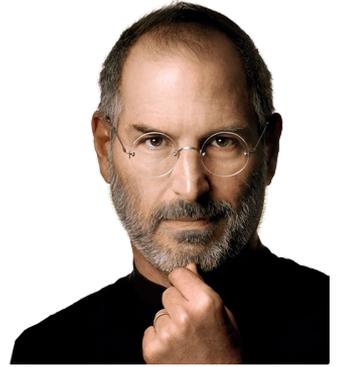
#	Task	Status	Due Date	Time Remaining	Note
1	Update contractor agreement	IN PROGRESS	Tomorrow	6h 20m	Planning
2	Plan for next year	PENDING	-	-	-
3	How to manage event planning	READY FOR DEV	Apr 28	-	-
4	Reminders for Tasks	REVIEW	-	2h	Execution
5	Budget assessment	ISSUES FOUND	-	-	-
6	Finalize project scope	IN PROGRESS	Today	1h	-
7	Gather key resources	READY FOR DEV	-	-	-
8	Resource Table	IN PROGRESS	Today	-	-
9	Resource allocation	REVIEW	May 21	-	-
10	New contractor agreement	ISSUES FOUND	Tomorrow	1d	-
11	Update key objectives	IN PROGRESS	-	-	-



2 Work on Your Presentation Skills for Visibility Gain

Presentation Skills

- If your work / research is great but **invisible**, it does not help anyone!
 - Steve Job's philosophy (Think Different)
- Scope
 - Presenting your work in **workshops** / events / scientific meeting
 - Sharing your work on **Social Media** (LinkedIn, X, etc.)
 - Having **web-pages** and **websites** for projects
 - Clear and engaging **slides, posters, videos**, and demos
- Advantages
 - **Visibility** and **reputation gain** in the community
 - Possible **networking** and research extension
 - Chances for **collaboration** and follow-up projects
 - Improved confidence and communication skills



Presentation Skills



Ali Tourani reposted this

Jose Luis Sanchez-Lopez · 1st
Research Scientist | Deputy head of the Automation and Robotics Resear...
1yr ·

Our latest paper on Vision-based Situational Graphs (S-Graphs) has just been published! Please, take a look at it! ...more

Robotics MDPI
2,101 followers
1yr ·

New paper online "Vision-Based Situational Graphs Exploiting Fiducial Markers for the Integration of Semantic Entities" in **Robotics MDPI**, by **Ali Tourani, Hriday Bavle, Deniz İşinsu Aşşar, Jose Luis** ...more

91
1 comment · 3 reposts

Like Comment Repost Send

vS-Graphs: <https://snt-arg.github.io/vsgraphs-results/>



iMarkers: <https://snt-arg.github.io/iMarkers/>

uni.lu University of Science, Technology and Innovation SNT

Mobile phone cam

TechXplore Research team proposes unclonable, invisible machine vision markers

SNT Highlights Invisible Markers Make Their Way in the World



AUTOMATION & ROBOTICS SNT uni.lu
[HTTPS://WWW.UNI.LU/SNT-EN/RESEARCH-GROUPS/ARG/](https://www.uni.lu/snt-en/research-groups/arg/)

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Home Videos Playlists

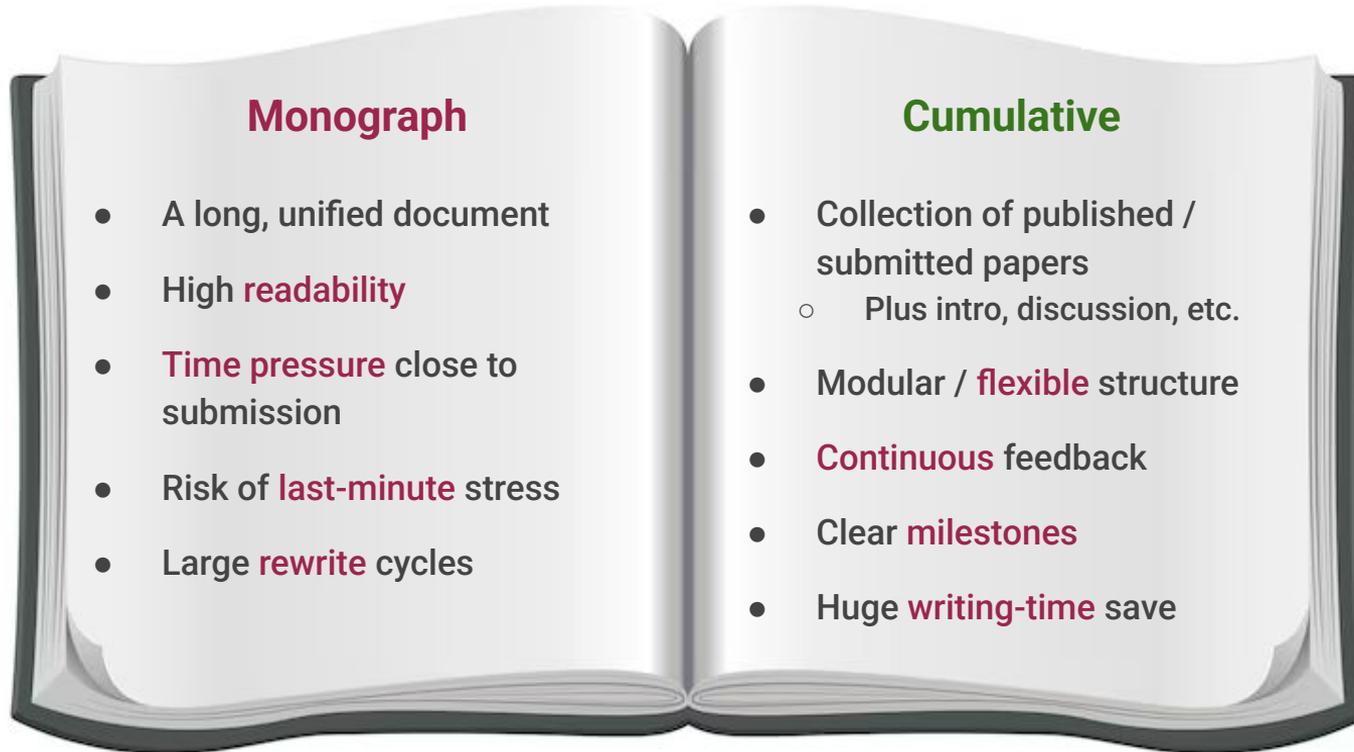
Created playlists

- Human-Robot Interaction
- Sensors and Devices
- Drone Grippers
- Short Videos
- Events Participation
- Robot Manipulation

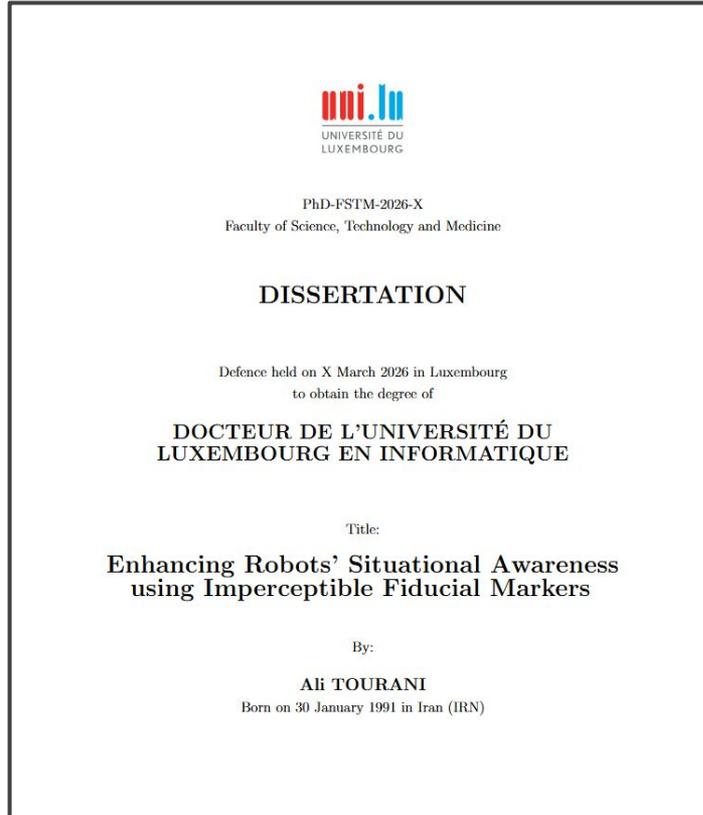
3

Plan for a **Cumulative
Thesis!** It Saves Your
Life!

Cumulative Thesis



Cumulative Thesis

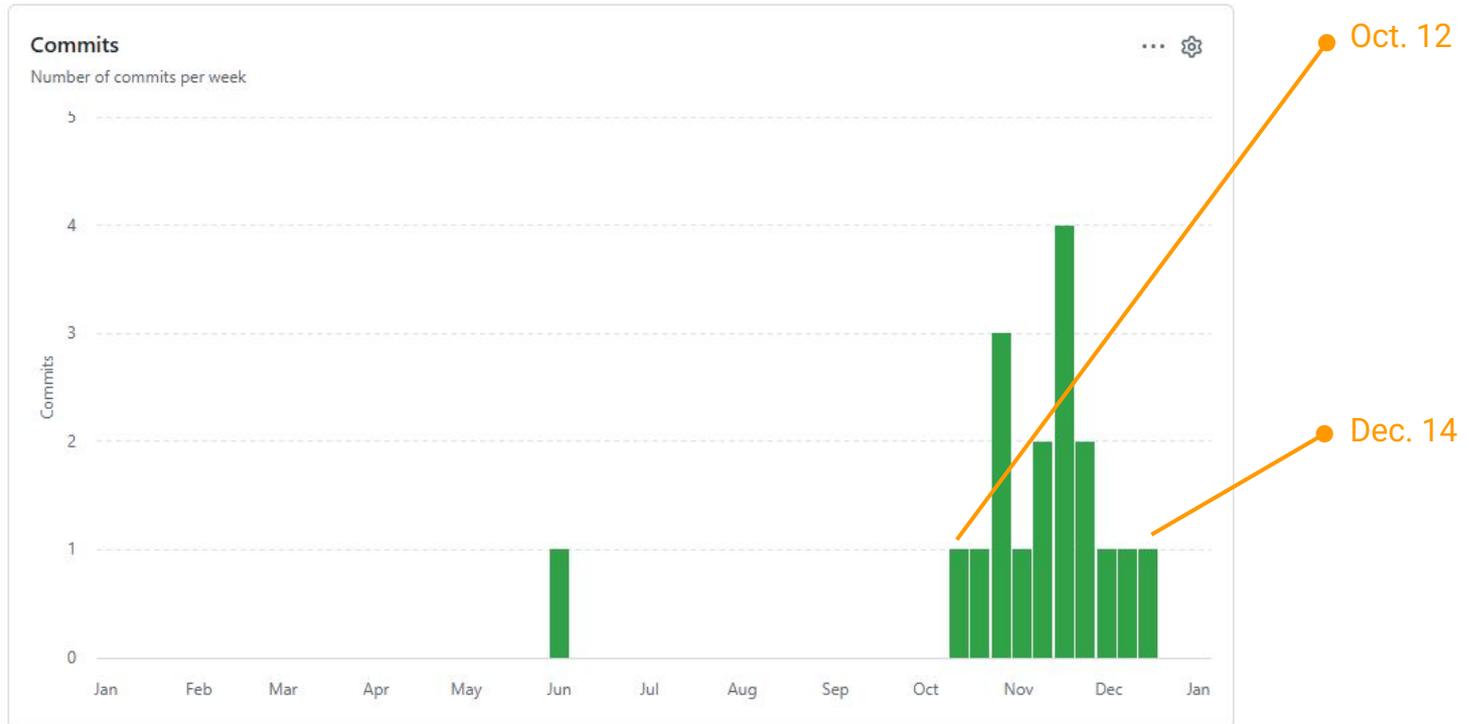


Case: My Thesis

- **Method:** Cumulative
- **Papers:** 5 (three published, two under revision)
- **Pages (first draft):** 181
- **Workload (approx.):** two months

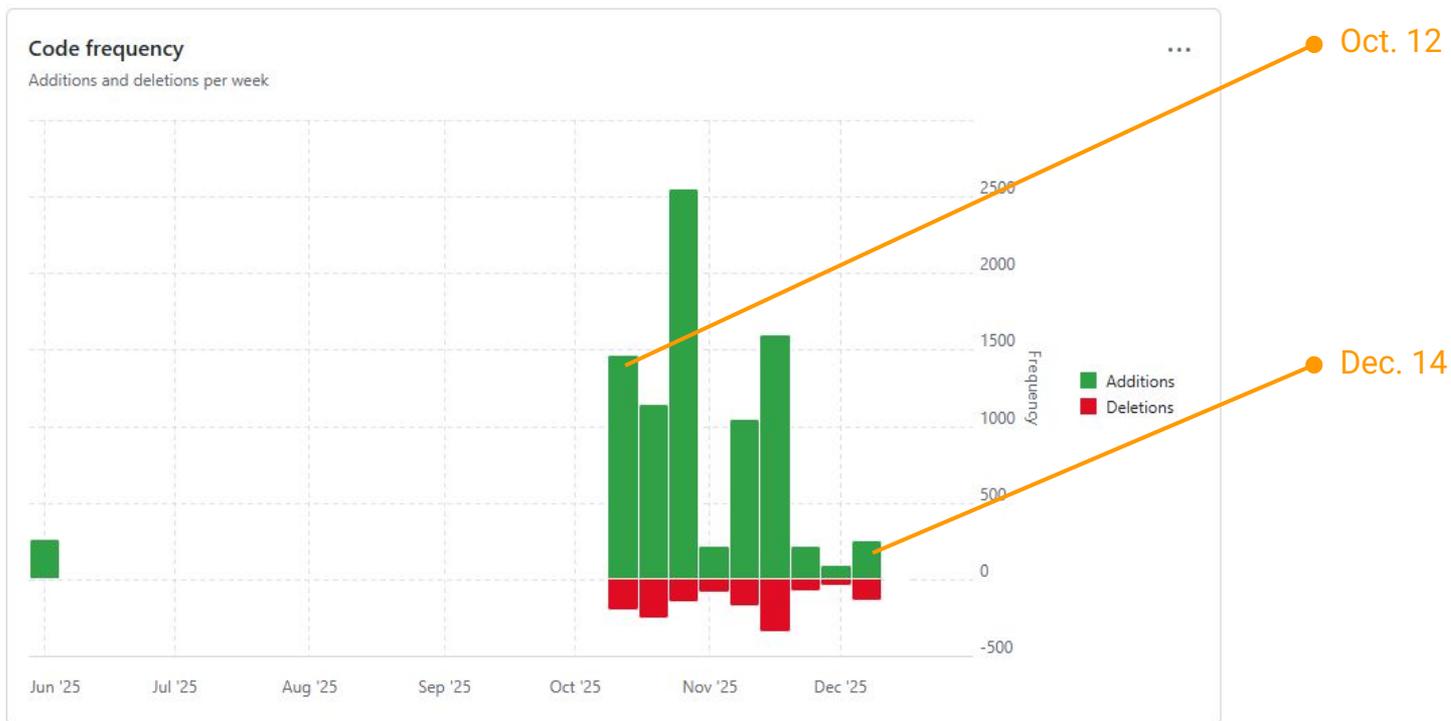
Cumulative Thesis

Commits over the last year of alitourani/Thesis



Cumulative Thesis

Code frequency over the history of alitourani/Thesis



4 Know the **Software** **Open-Sourcing** Benefits

Software Open Sourcing

- Why Open Source?
 - Increases **visibility** and **impact** of your work
 - Improves **reproducibility**, **reuse**, and **references**
 - Attracts **feedback** and **contributions**
 - Useful for both academia and industry
- Process
 - Code available on **GitHub** (or Gitlab)
 - **Clean code** and **documentation** (presentation skill)
 - Fill in ownership / IP notification forms for **TTO**
 - Receive a well-aligned CC BY **license**
 - GPL v3, MIT, Apache, etc.
 - **Publish** the code
 - **Voilà!**



Our People

Jacek PLUCINSKI

Technology Transfer Officer

Contact

✉ jacek.plucinski@unl.lu

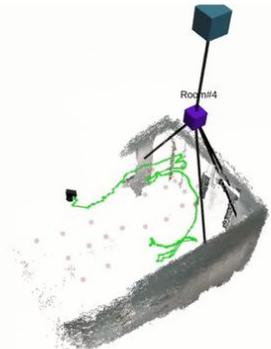
☎ (+352) 46 66 44 5484



Software Open Sourcing

README GPL-3.0 license

Visual S-Graphs (vS-Graphs)



ArXiv 2503.01783 Docker available YouTube watch Build Passing Test Passing ROS2 Jazzy License GPLv3

vS-Graphs is inspired by [LiDAR S-Graphs](#) and extends [ORB-SLAM 3.0](#) by integrating optimizable 3D scene graphs, enhancing mapping and localization accuracy through scene understanding. It improves scene representation by incorporating building components (i.e., wall and ground surfaces) and inferring structural elements (i.e., rooms and corridors), making SLAM more robust and efficient.

vS-Graphs Architecture

The diagram below shows the detailed architecture of the vS-Graphs framework. It illustrates the flow of data from camera input through feature extraction, graph construction, and optimization, leading to a 3D scene graph and localization results.

About

🚀 vision-driven Situational Graphs (vS-Graphs)

🔗 snt-arg.github.io/vsgraphs-results/

computer-vision robotics slam
visual-slam

📖 Readme

🔗 GPL-3.0 license

📈 Activity

📁 Custom properties

⭐ 28 stars

👁 6 watching

🍴 1 fork

Report repository

The paper is not published yet and no advertisement on LinkedIn

vS-Graphs: <https://snt-arg.github.io/vsgraphs-results/>

Software Open Sourcing

 [lidar_situational_graphs](#) Public

Repository to generate in real-time Situational Graphs (S-Graphs) for robot pose and map optimization using 3D LiDAR Data

 C++  302  35

- Open-Sourced Code
- Higher Visibility
- Better Network
- More Reputation
- More Citation



Ali Tourani reposted this

 **Jose Luis Sanchez-Lopez**  • 1st
Research Scientist | Deputy head of the Automation and Robotics Resear...
1yr • Edited • 

It's open-source!!!
We have released as open-source our LIDAR-based Situational Graphs (S-Graphs) as a ROS2 package, under the GPLv3 license: ...more



Floors
Rooms
Walls
Keyframes

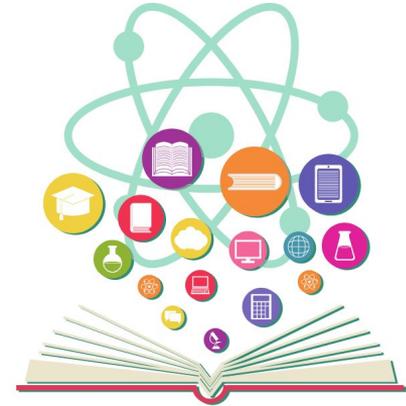
 459 14 comments · 26 reposts

 Celebrate  Comment  Repost  Send

5 Plan for **Interdisciplinary** **/ Multidisciplinary** Research

Inter/Multidisciplinary

- Why Does It Matter?
 - Combines **different expertise** to find better solutions
 - Always hot-topic projects!
 - Encourages **novel perspectives**
 - Boosts collaboration opportunities
 - Helps in **general solution** detection
- What are the Challenges (Personal Experience)?
 - There is no **common terminology** among disciplines!
 - **Communication** is challenging.
 - **Scopes** are unclear.



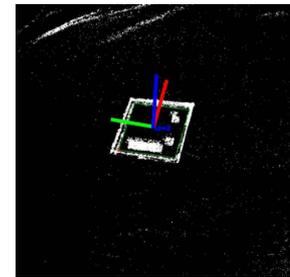
Inter/Multidisciplinarity



IAS Event - Transcend Project - 2022

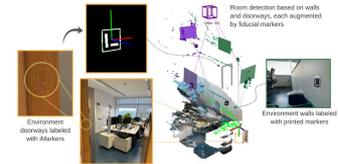
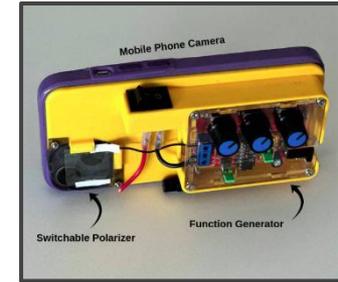


(Physics) Marker Fabrication



(CS) Software Development

(Engineering) Sensor Design



(CS + Eng) Robotics

6 Consider Writing a **Survey** Paper

Survey Paper

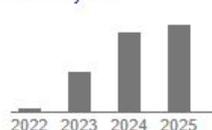
Andrew Ng

Stanford University
Head of Google Brain
Former Chief Scientist at Baidu



- How can survey writing help?
 - Gives you the **Big Picture** about a topic
 - Gives you a **more profound understanding** of the topic
 - Gives you the chance to have **your opinion**
 - If you have read **50+ papers** about it (Andrew Ng)
 - Helps you find the **trends** and **gaps** in the domain
 - Gains **citations** and **reputation**
 - Saves you in your **thesis writing**
 - Considered as the SOTA section

Total citations Cited by 153



Editor's Choice Review 29 November 2022

Visual SLAM: What Are the Current Trends and What to Expect?

Ali Tourani^{1*}, Hriday Bavle¹, Jose Luis Sanchez-Lopez¹ and Holger Voos^{1,2}

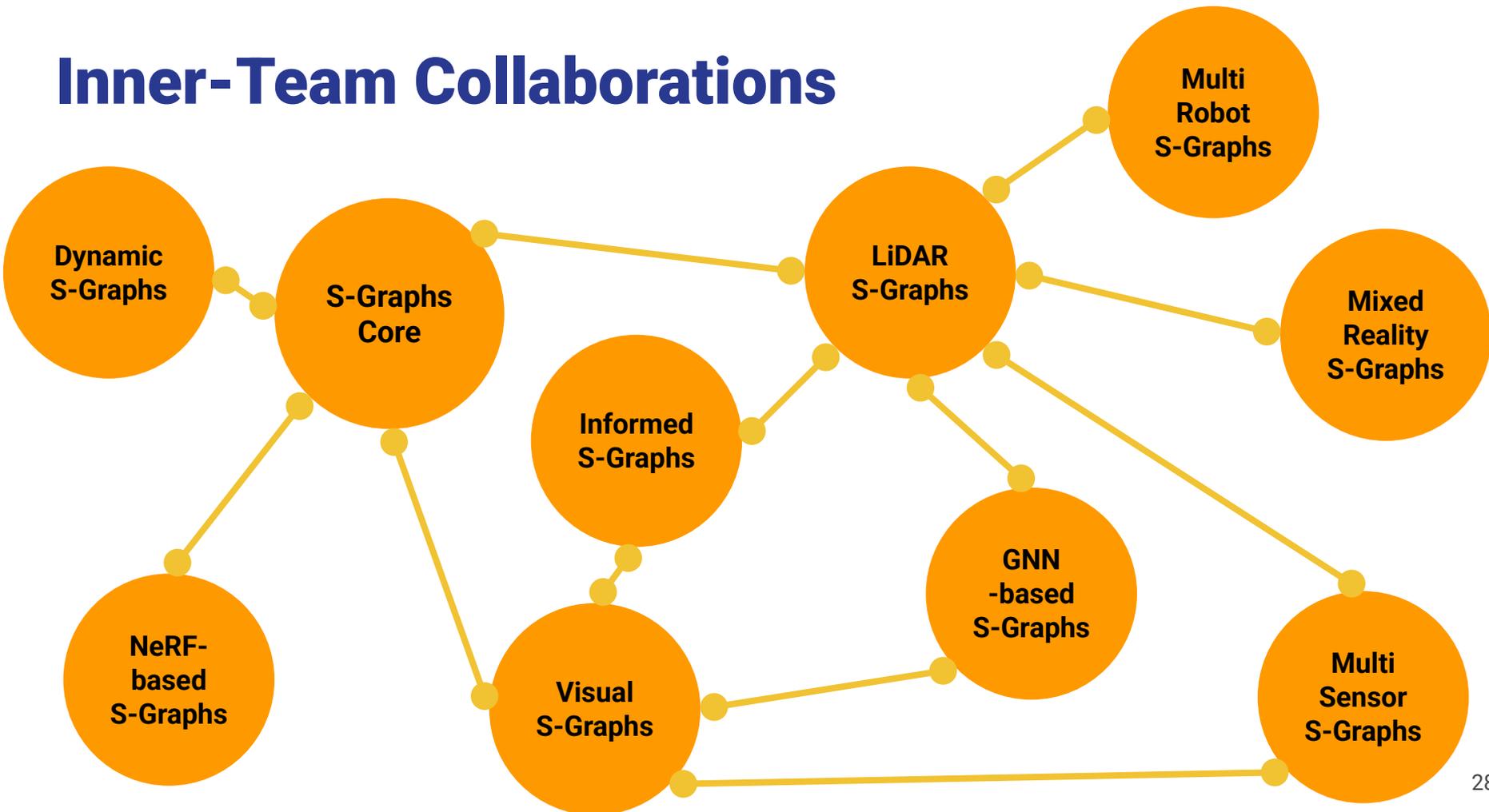
7 Do not Underestimate Inner-Team Collaborations

Inner-Team Collaborations

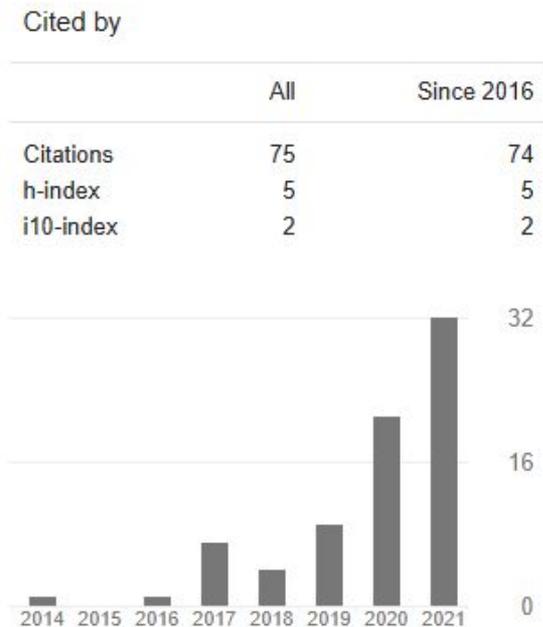
- Why Does It Matter?
 - Time during a Ph.D. is **limited!**
 - Working **alone** slows progress!
 - Everyone is **busy** building similar tools and pipelines
- Potential Benefits
 - Faster **research progress** through sharing resources
 - Code, datasets, baselines
 - Code **reusability** and avoid “reinventing the wheel”
 - Stronger **team output** and visibility
 - More **papers** with less duplicated effort
 - Increased **citations** through shared foundations



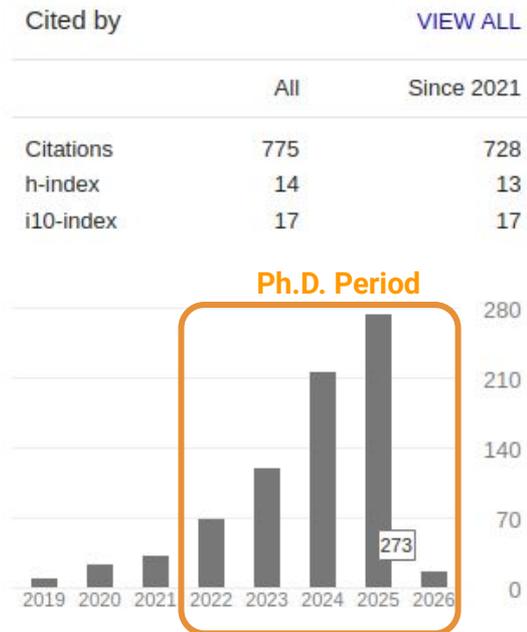
Inner-Team Collaborations



Inner-Team Collaborations



Before Ph.D.
(by Wayback Machine)



Current Time

8

Know the Right AI Tools !
It is a Soft Skill.

AI Tools

- Move faster in research using **AI tools** and **frameworks**!
 - Save **time** and **mental energy**
 - Need **verification**, **validation**, and **originality check**
 - Correct using the tools is a demanding soft skill!
 - Prompt engineering, API integration, etc.



brainstorming,
explaining
concepts



speed up
routine coding
tasks



reading papers,
summarizing PDFs

 **Claude**
understanding long
codebases & refactoring

 **Gemini** Resource finding,
research

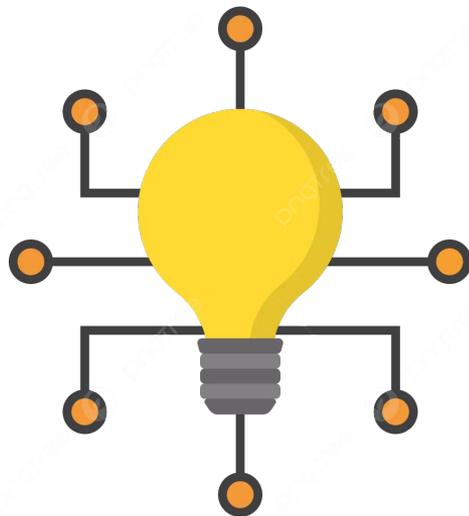


Presentation

9 Consider a **Side Research**

Side Research

- A small, low-pressure project alongside the main Ph.D. topic
- Prevents becoming single dimensional
- Why can it help?
 - Makes space for **creativity** and **experimentation**
 - Lower **risk**, higher fun
 - Broader **research profile**
- My Case
 - RAG + Vision Language Models
 - Can be applied into robotics domain



Thank
You!

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February 2026