SUTD Leap

[RE]IMAGINE EDUCATION

A weekly Design.AI newsletter

FROM ROBOTS TO RESPONSIBLE AI: BUILDING THE FUTURE OF LEARNING

Assistant Professor Malika Meghjani, ISTD
In Conversation with Dr. Nachamma Sockalingam, OSP

https://www.sutd.edu.sg/profile/malika-meghjani/

In this week's newsletter, we spotlight Assistant Professor Malika Meghjani, who works at the intersection of Robots, and Artificial Intelligence. As the founder of the MARVL Lab, she explores how robots can collaborate with humans in meaningful, cooperative ways.

Malika shares her journey into robotics and why she believes "resistance to generative AI (GenAI)" is futile. In her courses, she allows students to use GenAI at their own discretion and discusses with them how they utilize AI to set the guardrails.

She also reflects on the "human element" in AI writing, the challenges of model bias, and practical strategies for staying focused in a hyper-digital world.

Her story is not just about technology, it's about cultivating curiosity, resilience, and responsibility.

Let's get inspired!

Editor of Newsletter:
Dr. Nachamma Sockalingam, Office of Strategic Planning

Contact nachamma@sutd.edu.sg to share your Design AI stories

Nacha: Hi Malika, what first sparked your curiosity and journey in Robotics, and how did it lead to the founding of the MARVL Lab at SUTD?

Malika: My passion in robotics has been a long, exploratory journey rather than a planned one. Back in India, as an undergraduate in electronics and communication, I was fascinated by how a spark of electricity could become beautiful images on a screen. That curiosity about computers drew me deeper into electronics and communication, then into computer vision, and eventually into robotics, because robotics allowed me to see how my work could physically interact with the world.

When I first came to Singapore as a postdoctoral scholar under NRF funding, I led the self-driving car team at SMART. Working with autonomous vehicles was eye-opening. It was no longer just theory; it was about watching **humans interact with AI-driven cars in the real world.** I was also interested in looking at **multi-robot coordination.**

These various experiences led me to establish the **Multi-Agent Robot Vision and Learning Lab (MARVL Lab)** at SUTD. MARVL lab's focus is on human-centric applications of multi-robot systems. For example, one of our PhD projects examines **how an AI partner can adjust its cooperation based on the expertise levels and preferences of its human partner.**

https://www.malikameghjani.com/

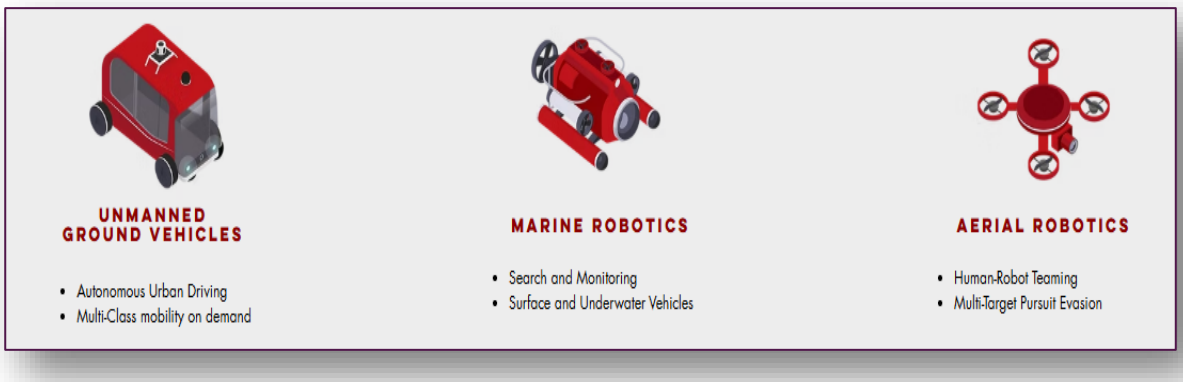
Nacha: How do you integrate GenAI in your teaching, and what do you expect from your students when they use it?

Malika: I teach Mobile Robotics, and Machine Learning. In the Mobile Robotics course, we teach concepts of a self-driving car, using a scaled-down car instead of a real car. Students test out their car on a racetrack at the Sports complex at SUTD to validate their ideas. Students are welcome to adopt any Gen.AI tools that are available. There is no point in resisting GenAI. That's the future and that's the present as well. So we fully embrace Gen.AI tools in our coursework.

But we highly focus on certain skills. For instance, **acknowledging the sources** that they are learning from is very important. Acknowledgement is not about discrediting students' work; it's about **gratitude and transparency**. If a student uses GenAI to draft a project but acknowledges it properly, that's absolutely fine — in fact, it shows **integrity**. But if they use these tools, or even peer support, without acknowledgement, that's where it becomes problematic.

What I want students to see is that **GenAI can be their learning partner**, **not a shortcut**. I really like SUTD's new tagline: '**AI as your learning partner**.' **Learning should never rely on a single source**. With AI, you now have a **vast, open, crowdsourced solution** — and that can transform the way we think and learn.

At the same time, we also need to **recognize AI's limits**. It can generate polished answers, yes, but often what's **missing is the human depth and element behind the work** — and that's where students and educators still play an irreplaceable role.



https://www.malikameghjani.com/

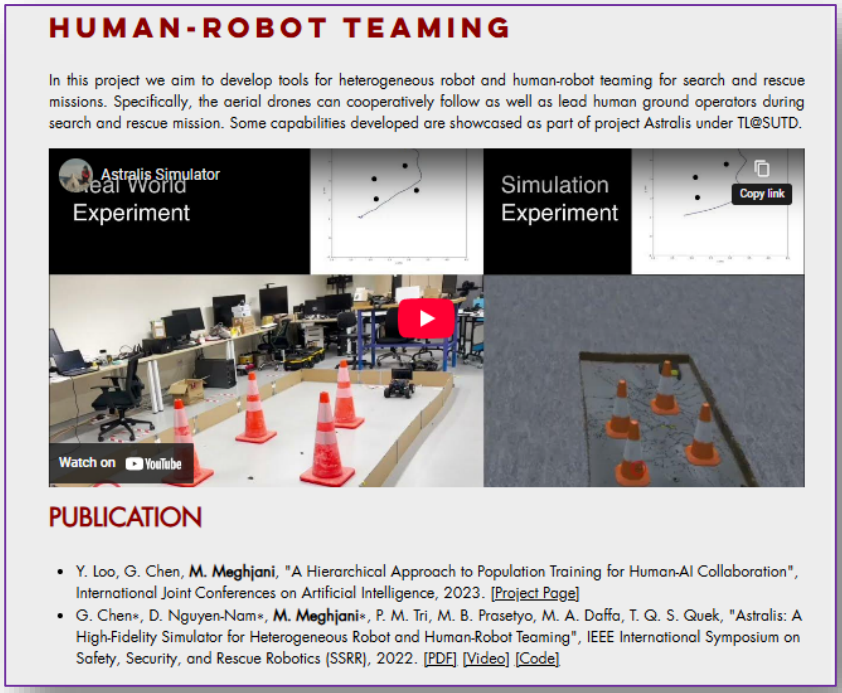
Nacha: You mentioned that AI-generated work often looks polished but lacks the "human element". How can students and educators ensure they go beyond superficial use of AI tools?

Malika: "Yes, that's something I feel strongly about. **GenAI outputs can often look very polished and professional on the surface**, but when you read carefully, you realize they can be **shallow**. Compare a Gen.AI-written essay versus one written by a human. It will look perfect in terms of grammar and semantics. But it's missing the soul.

The originality and depth that come when a human is writing, in terms of connecting ideas, experiences, and contexts, and even choice of words, cannot be matched by machines.

I emphasize the **fundamentals. Students need to build the basic skills of analysis, reflection, and reasoning.** Without that foundation, even the best AI tool won't make their learning meaningful.

And this ties **directly into another critical issue with AI: bias**. Because if we accept AI's polished answers without critical thinking, we risk inheriting the limitations and prejudices embedded in the data itself.



https://www.malikameghjani.com/aerial-robotics

Nacha: Given your background, you are better placed to tell us about model bias. Could you suggest what educators and students need to understand about bias in AI, and how they can use AI/GenAI tools responsibly?

Malika: That's a very important question. **One of the challenges with AI is that it's only as good as the data it's trained on.** If the data is biased, the AI will reflect and sometimes even **amplify those biases**. For example, if the training data overrepresents one gender, one cultural context, or one type of environment, then the outputs you get are going to be skewed in the same direction.

This is why it's so **critical for students and educators to question AI outputs, not just accept them because they look polished. However,** we may not know the datasets used to train the AI model most time. Hence, we need to **apply fundamental knowledge to help deconflict or question AI output.**

In my lab, we also look at **how AI can learn to cooperate better with humans of different backgrounds and skill levels.** That means making AI more adaptive and inclusive. But **the responsibility doesn't just lie with the developers, but it lies with all of us who use these tools**. If we're careless, we risk letting AI reinforce inequalities rather than reduce them.

And as educators, we need to address this in how we teach.

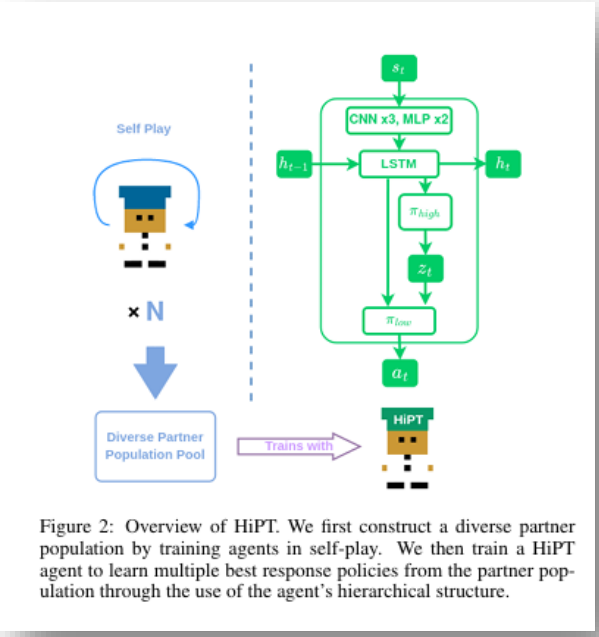


Figure 2: Overview of HiPT. We first construct a diverse partner population by training agents in self-play. We then train a HiPT agent to learn multiple best response policies from the partner population through the use of the agent's hierarchical structure.

AI collaboration with diverse human partners

https://arxiv.org/pdf/2305.16708.pdf

"Responsible use of AI doesn't just lie with the developers, but it lies with all of us who use the tools."

Nacha: With AI becoming such a central part of education, what new skills do you believe students must develop to thrive in this landscape?

Malika: First and foremost, the **fundamentals are non-negotiable**. AI can help students with many things, but if they don't understand the basics of a subject, then they will never be able to judge whether what AI is producing makes sense. Without fundamentals, students risk just becoming passive consumers of technology.

Beyond that, students need to cultivate **critical thinking and reflection**. AI is very good at providing answers, but most earlier models don't question themselves- although some of the later models do. Humans need to ask: *Is this answer valid? What context is missing? What's the alternative view?* That's where human learning stands apart.

I often use the GPS analogy: AI can give you the shortest route from point A to point B, but unless you understand the map, you will never know if it's the best route. Similarly, **students must understand their subject deeply enough to know when AI is helping them, and when it's misleading them. Use of AI is a social responsibility.**

Another important skill is **adaptability**. Technology is evolving fast, and the tools we have today will look different tomorrow. So, students must learn how to keep learning — how to engage with new tools, but without losing their own thinking in the process.

"Fundamentals are non-negotiable.
AI can only enhance, not replace them."

Dr. Malika Meghjani reminds us that in the age of AI, "resistance is futile" — but so is "blind acceptance". While AI can polish and speed up work, "what's missing is the human element— the originality and depth only humans can bring."

Her call is clear**: build strong fundamentals, question AI outputs, and design learning that demands reflection**.

The future of education lies in partnership — where AI enhances, but never replaces, the human in learning.