

Call for action: Towards a research agenda for learning-enabled safety-critical real-time systems

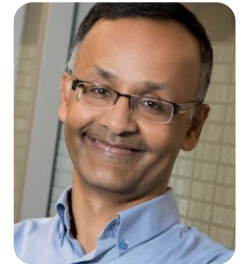


ML-RT-Agenda

A one-of-a-kind event
to build a collaborative
research agenda!



Mitra Nasri
m.nasri@tue.nl



Sanjoy Baruah
baruah@wustl.edu

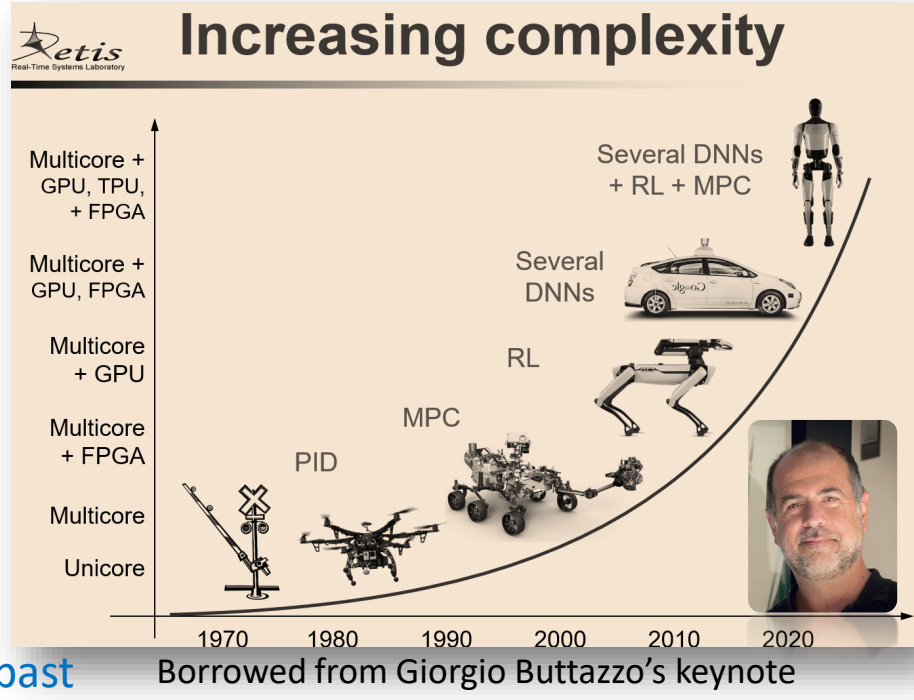
<https://www.ecrts.org/ml-rt-agenda-workshop/>

Why ML-RT-Agenda, and why now?

future

Machine-learning and AI technologies are here to stay

(it will be present in the future of safety-critical systems)



The AI field and applications are growing rapidly

Our research isn't visible enough to the ML/AI community

Plenty of opportunities, but where to start? Where to go?

Our research efforts in this direction are still sparse

It may not work in one go!

Why ML-RT-Agenda, and why now?



Sanjoy and I thought to organize a workshop (like a one-day Dagstuhl event) to gather our community's research roadmap



Keynote: **“A Roadmap for Real-Time Embedded AI”**



Keynote: **“Toward Predictable AI-Enabled Real-Time Systems”**



Why ML-RT-Agenda, and why now?

RT for ML

(How can our expertise help designing learning-enabled safety-critical systems?)



How can we design AI-enabled systems that are

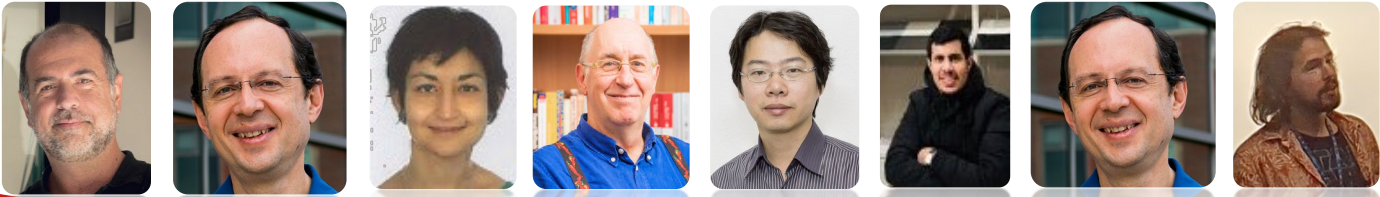
- Safer (or guarantee their safety)
- Faster
- Less energy consuming (more sustainable)
- More trustable
- More scalable
- Certifiable



We are specialized at managing **bottleneck** computing resources



• What have we accomplished so far?
• What shall we still do?
• What are the next interesting problems to look at?



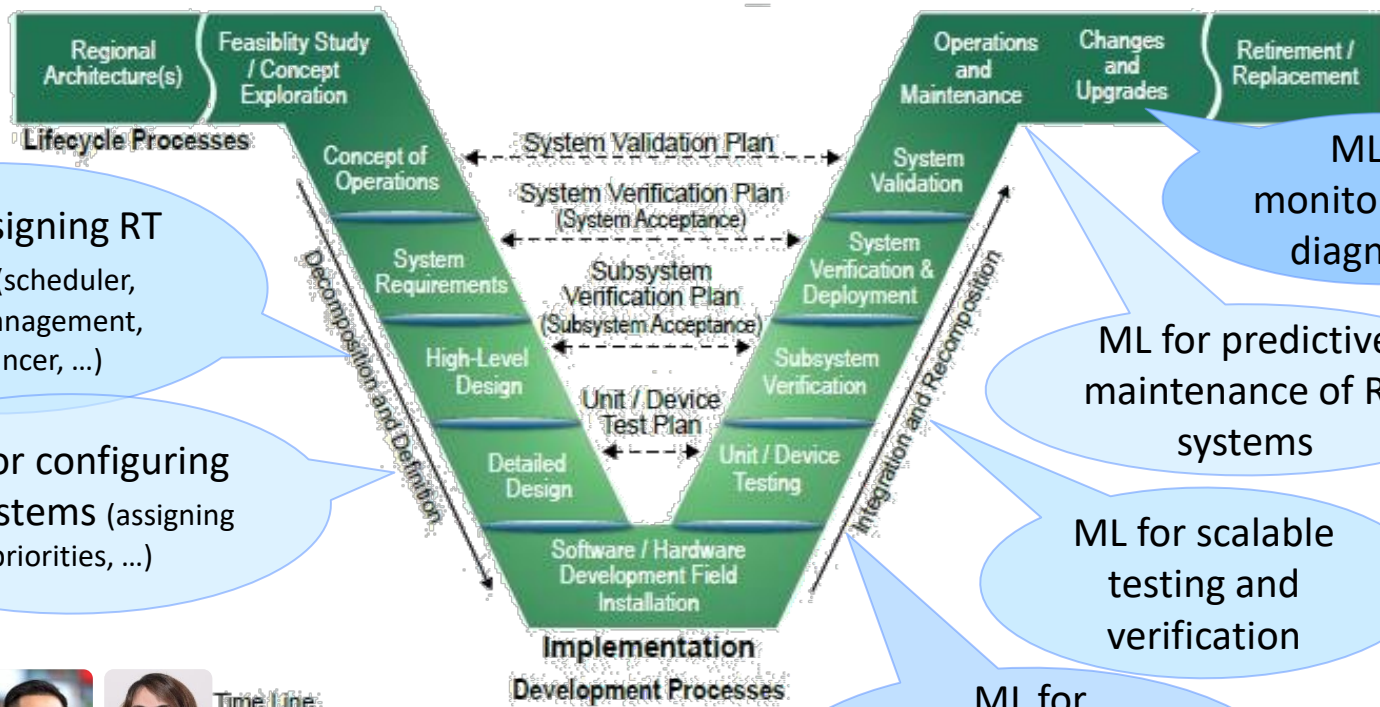
Why ML-RT-Agenda, and why now?

RT for ML

(How can our expertise help designing learning-enabled safety-critical systems?)

ML for RT

(How can ML and AI technologies help us design better real-time systems?)



ML for designing RT systems (scheduler, resource-management, load-balancer, ...)

ML for configuring RT systems (assigning priorities, ...)

ML for monitoring and diagnostics

ML for predictive maintenance of RT systems

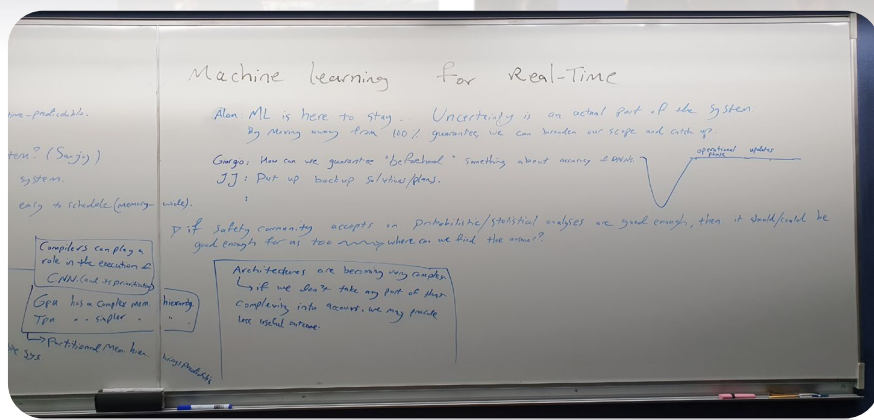
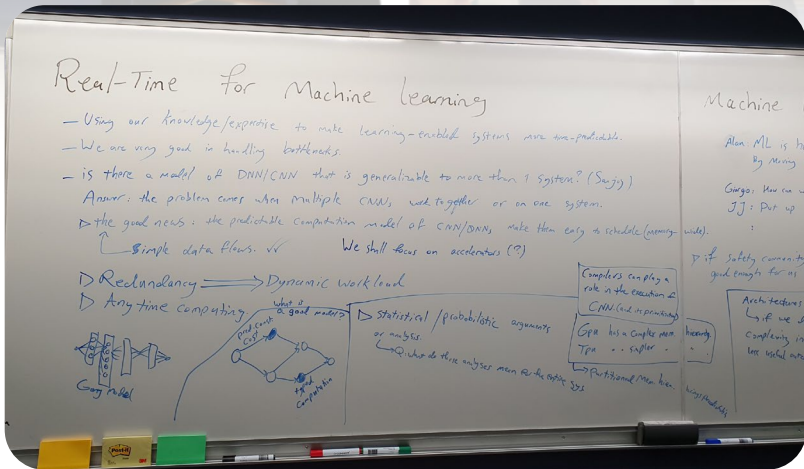
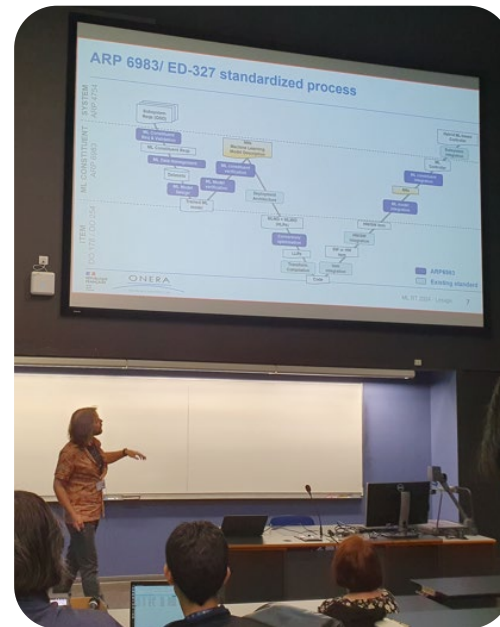
ML for scalable testing and verification

ML for understanding system behavior (WCET estimation, system identification, ...)



Time Line

We had fun!



We had fun!

And many more visited us during the day (on site and online)



Your opinion, and your role

Some propositions
(that you may like or dislike)

What else would you like to see
in the next events?

Will you attend our next event
at RTSS'24?



<https://forms.office.com/e/jQYiyyiH5U?origin=lprLink>

Thank you

**Our second event will be at RTSS'2024,
December 10, York, UK.**



If you want to be in our mailing list,
please fill this form
(or send an email to Mitra, m.nasri@tue.nl)

<https://forms.office.com/e/T4iVTbw9pf>

Want to share your journey (even failed experiences)?

Write a blog post for ACM SIGBED Blog.

<https://sigbed.org/blog/>

Send an email to Mitra to know more.