

Part 1 - notes from the decision letter

What the presentation should include

- Popular scientific presentation of your project proposal (research and innovation programs)
- A description of how the research is linked to the international research front
- A description what you want to accomplish with your money
- Your own plan for the future, i.e., how the project will affect your future as a researcher at LTU

- 1) The personal description of the report and what emerges from interviews with and presentation of the researcher. A focused and coherent presentation and discussion is considered positive

Assessment perspectives - 2

2) The integration with the six qualifying requirements already assessed in the proposal:

Relevance - a: how the research will contribute concretely to the development of Norrbotten. Especially interesting is any of:

- Sustainable Municipal Infrastructure and citizens security
- the priority focus areas of innovation strategy for Norrbotten County in 2013 - 2020
- E-health and health economics

Relevance - b: how the research will specifically help to strengthen LTU's strength and areas of innovation through collaboration and / or strengthen the established environment

Assessment perspectives - 3

Quality: international publication and citation, demonstrated ability to independently fund research, interpersonal skills internally at the university and externally, experience in building groups such as via PhD supervision

Feasibility and exploitability: A three-year research and innovation programs including a plan for collaboration with relevant stakeholders

Innovation: The innovation in research and innovation program

“Good qualities”: The simplicity and clarity of the project application

Assessment perspectives - summary

(Note: they are personal interpretations!)

- how the project benefits Norrbotten and LTU
- if it is:
 - feasible
 - exploitable
 - innovative
 - clear
 - attracting funds and generating publications

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Question: am I missing something?

Part 2 - first draft (by messages)

DISTRACT

*Distributed Optimization and Estimation
for Synergic Automatic Control*

Damiano Varagnolo
LTU SRT - Reglerteknik



Picturography

Venice (IT)



Chioggia (IT)



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Semur (FR)



Pueblo (CO)

Picturography

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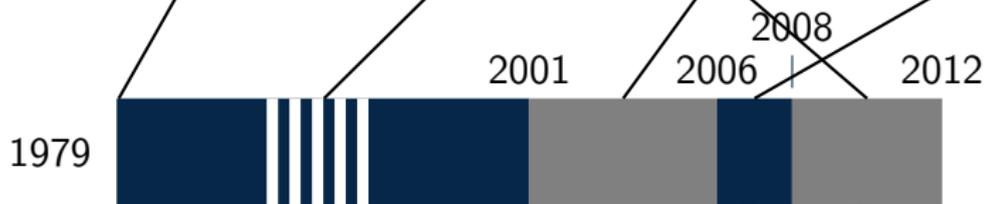
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Venice (IT)



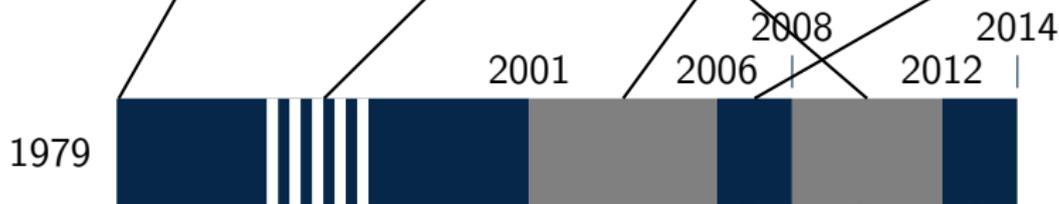
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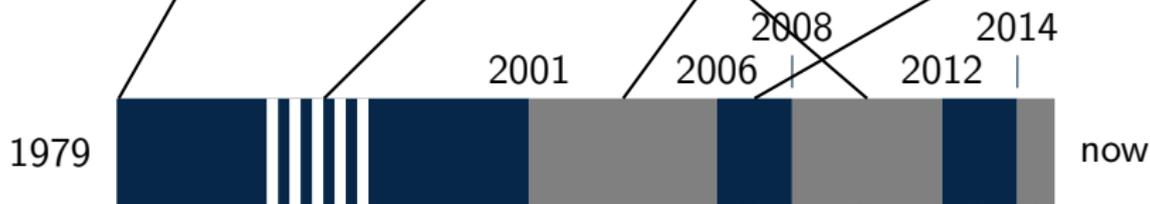
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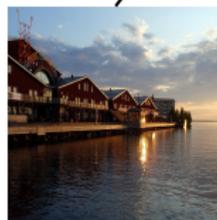
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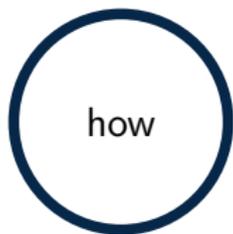
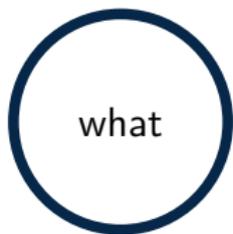
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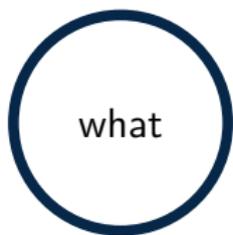


Stockholm (SE)



Luleå (SE)





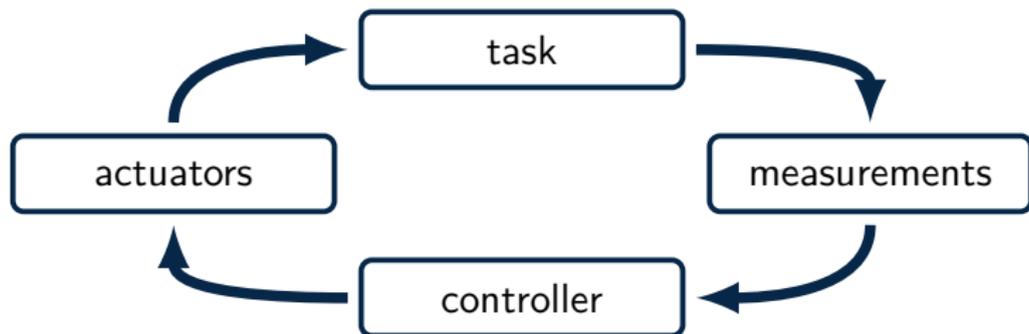
DISTRACT

Distributed Optimization and Estimation
for Synergic Automatic Control

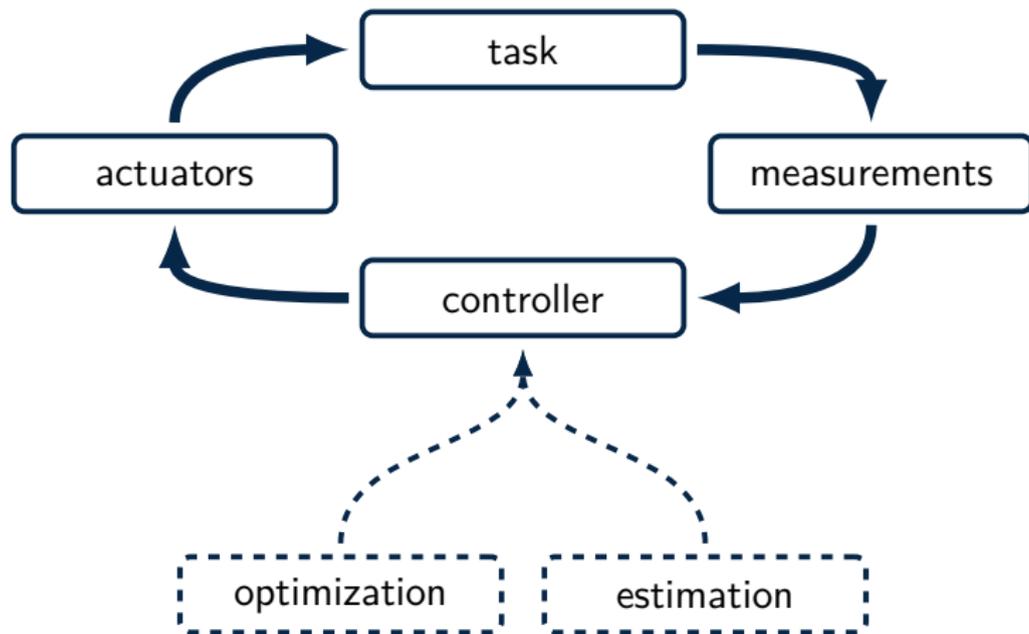
Automatic control



Automation = to solve tasks *automatically*



Automation = to solve tasks *automatically*



Formally:

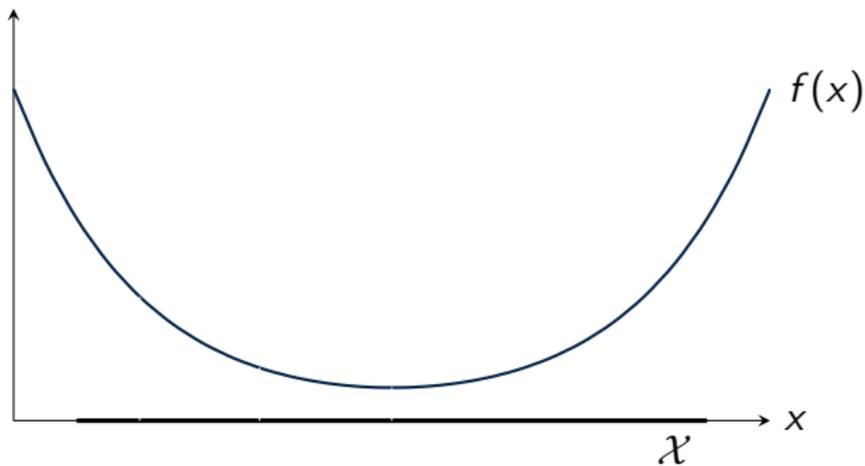
$$\begin{array}{ll} \text{minimize} & f(x) \\ \text{subject to} & x \in \mathcal{X} \end{array}$$

Optimization

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Practically:

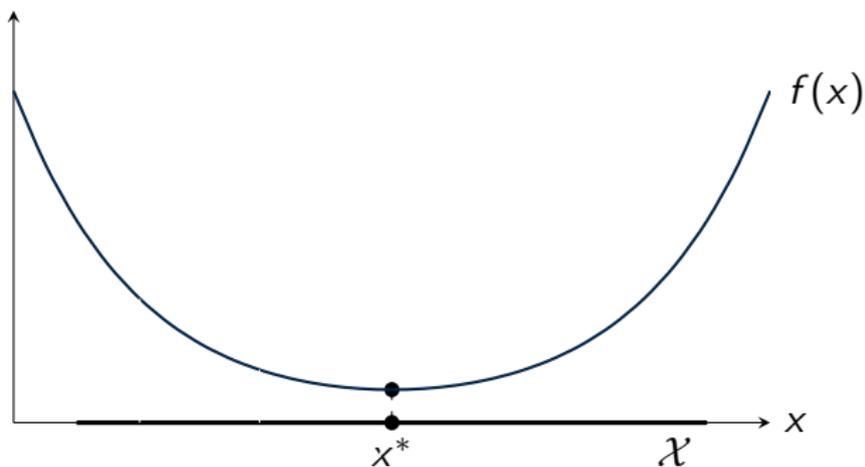


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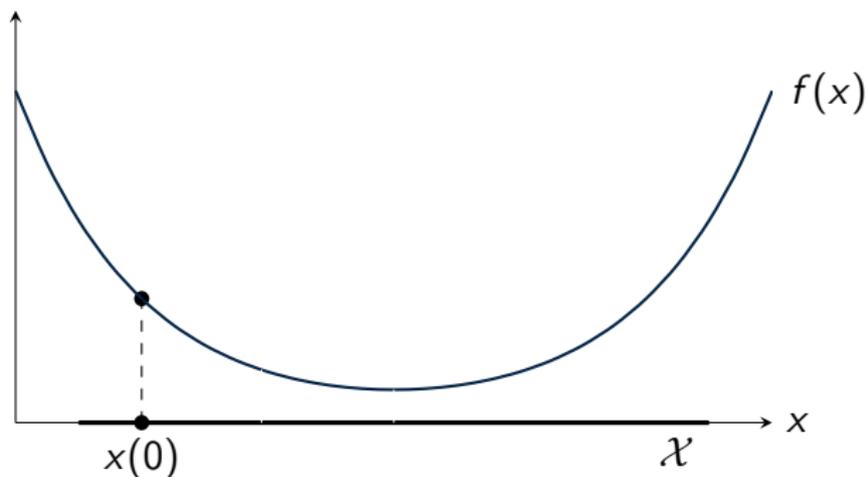


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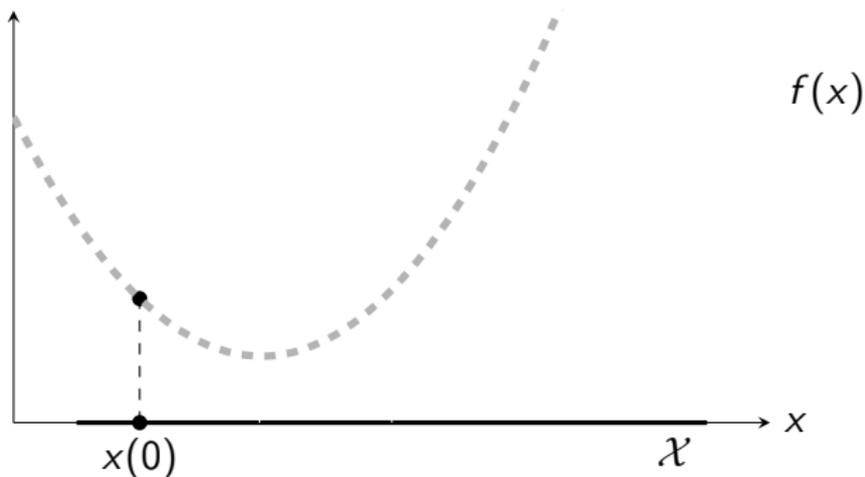


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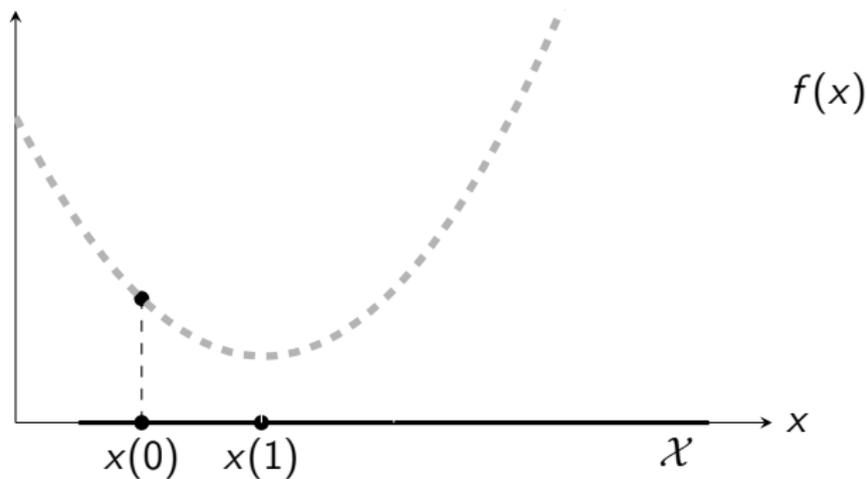


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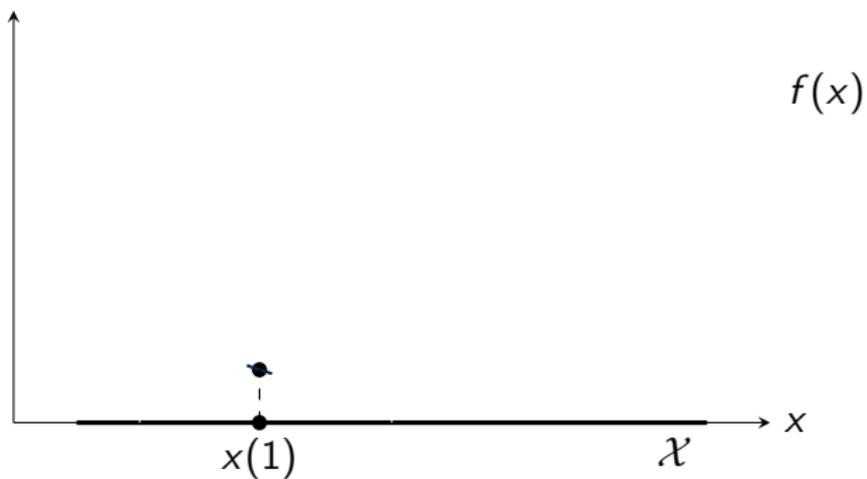


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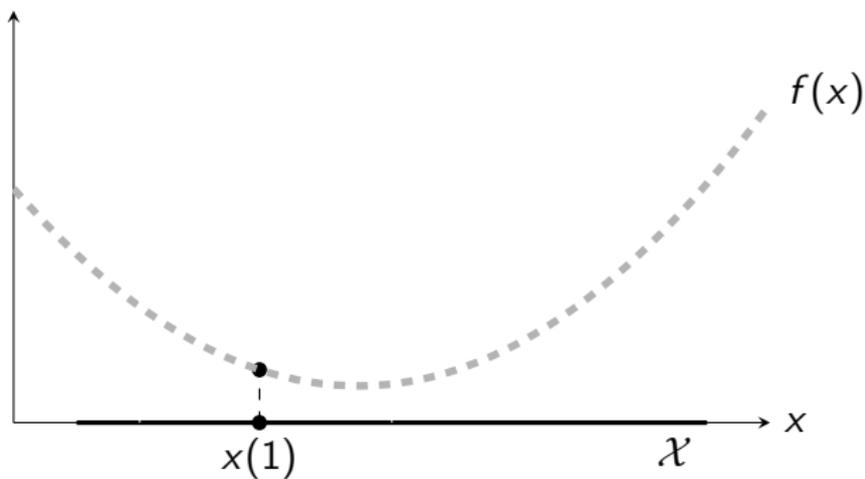


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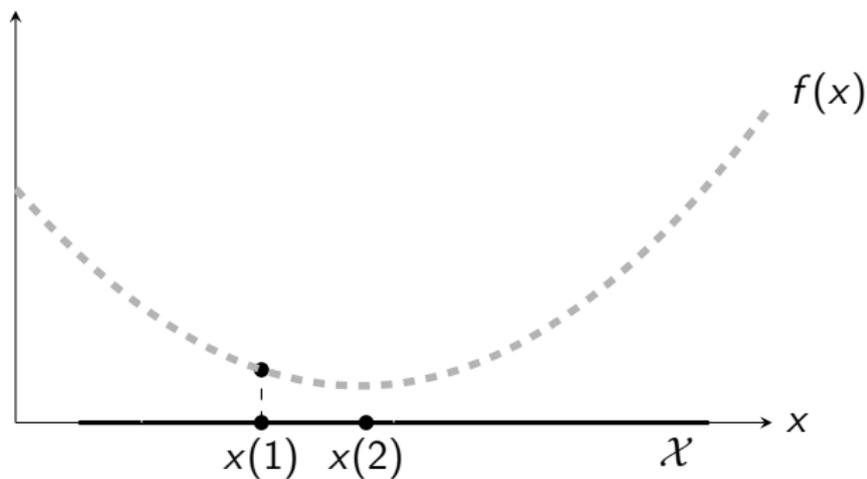


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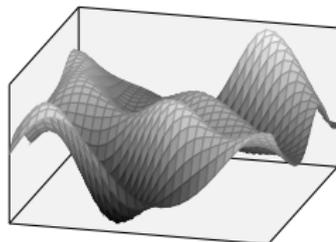
Estimation

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Practically:

true



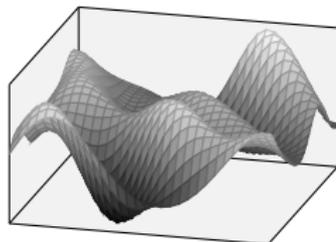
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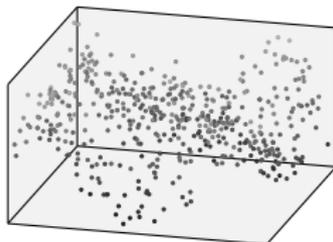
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true



measurements



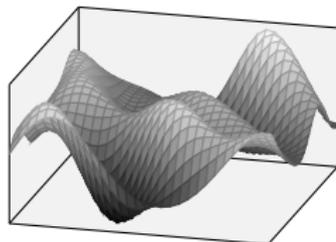
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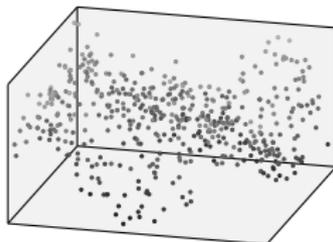
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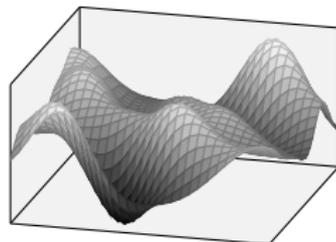
true



measurements



estimate

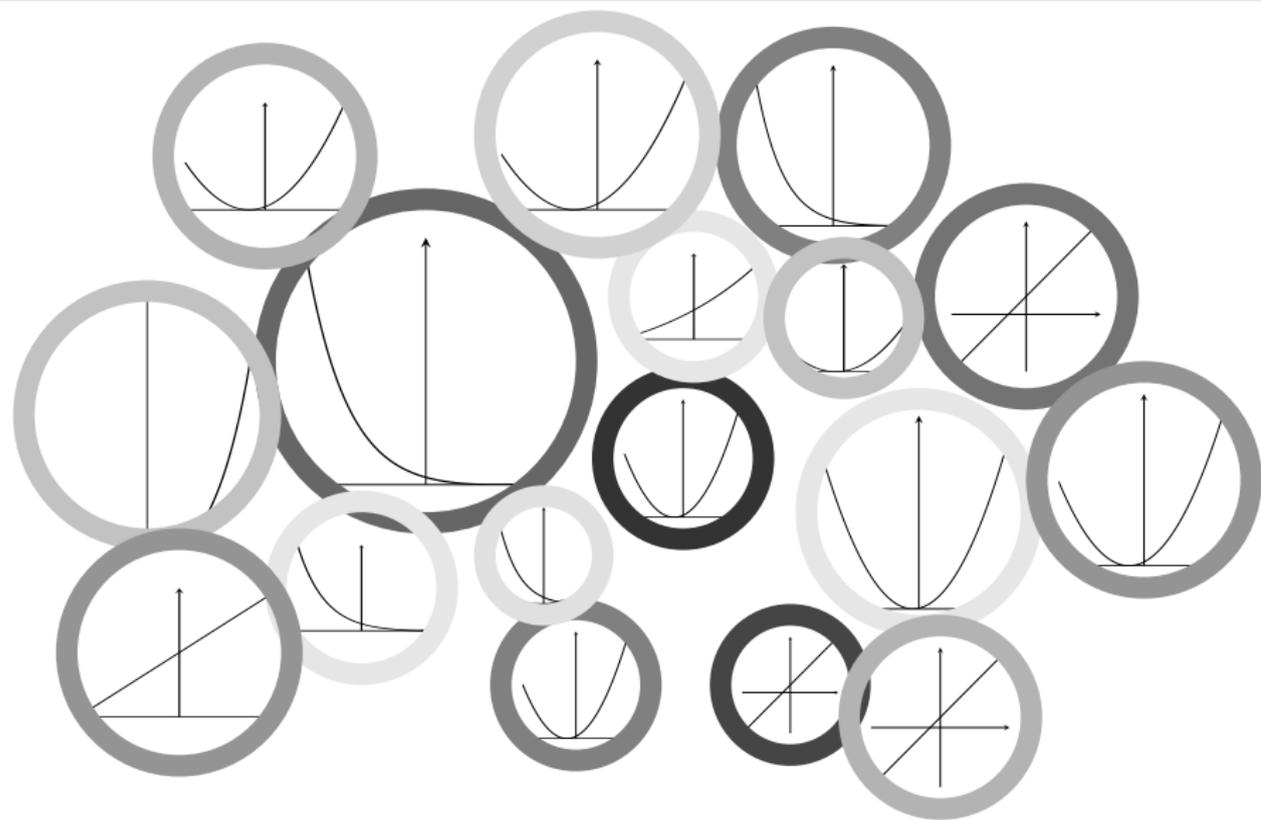


Distributed paradigms for a connected world

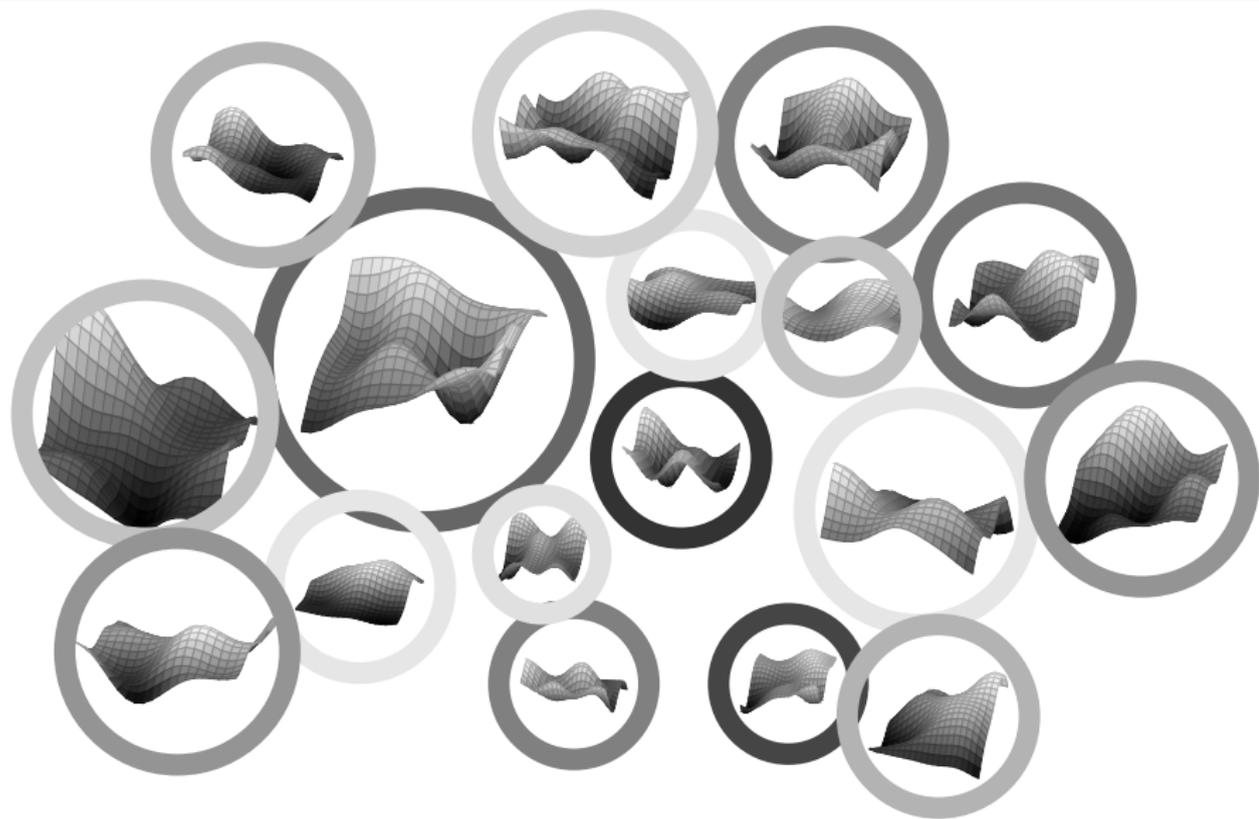


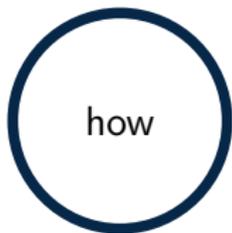
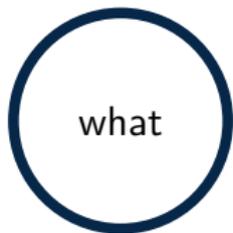
Atzori et al. (2010), The Internet of Things: A survey, Computer Networks

My innovation program 1: distributed optimization

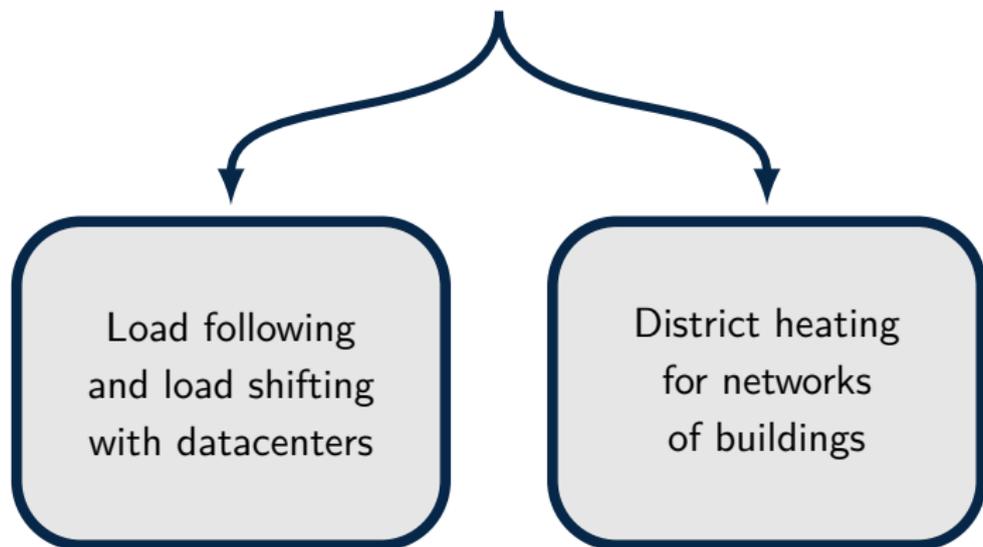


My innovation program 2: distributed estimation

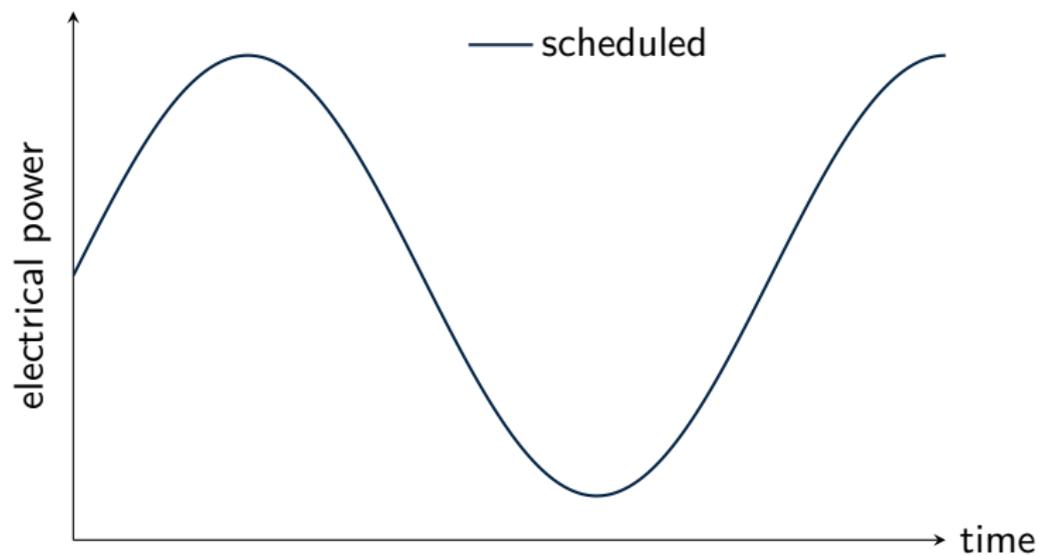




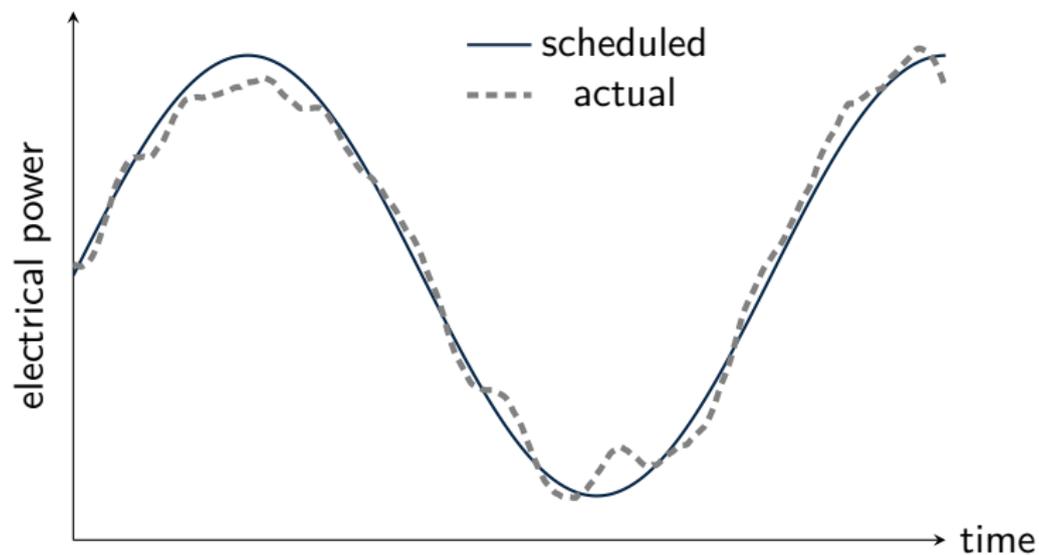
Exploitation Projects



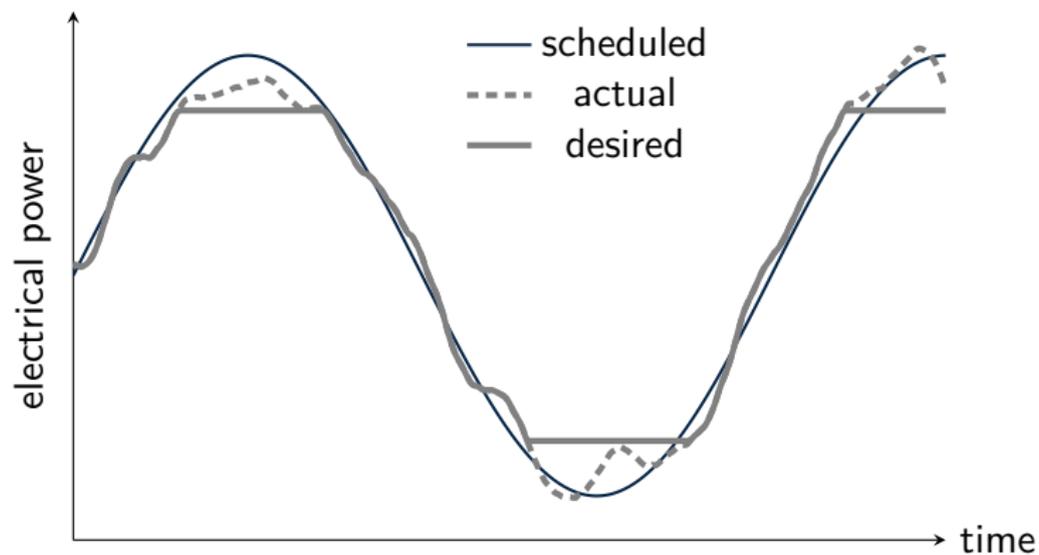
Load following and load shifting with datacenters



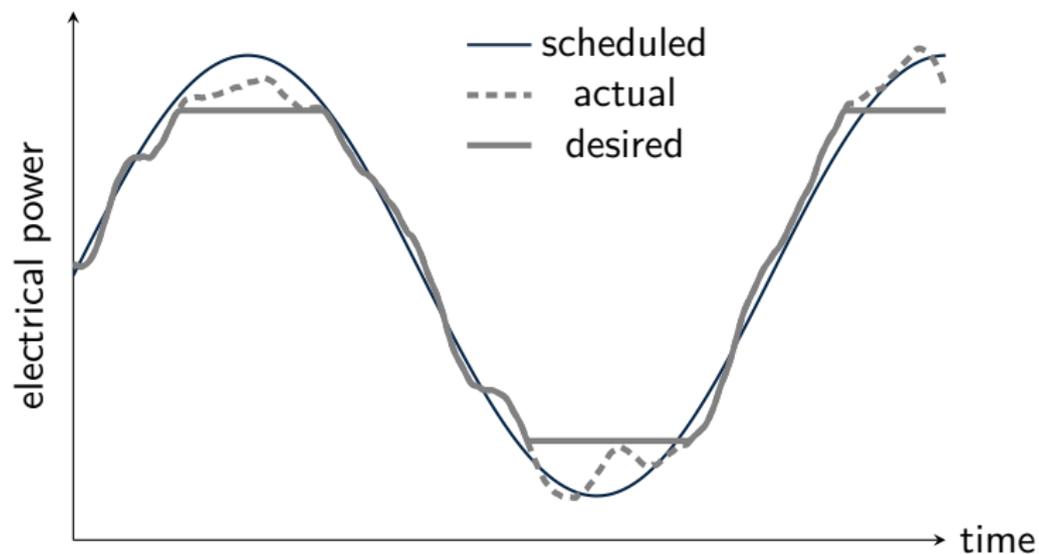
Load following and load shifting with datacenters



Load following and load shifting with datacenters



Load following and load shifting with datacenters



exploit datacenters thermal & computational capacity!

Load following and load shifting with datacenters

synopsys: thermal control of networks of datacenters for load following and load shifting

gaps in research frontier:

- no control over networks
- no management of uncertainties in the forecasts
- no tests on real structures

expected results:

- pure algorithms
- applied algorithms
- implementation and tests
- commercial products (?)
- publications & fundraising activities



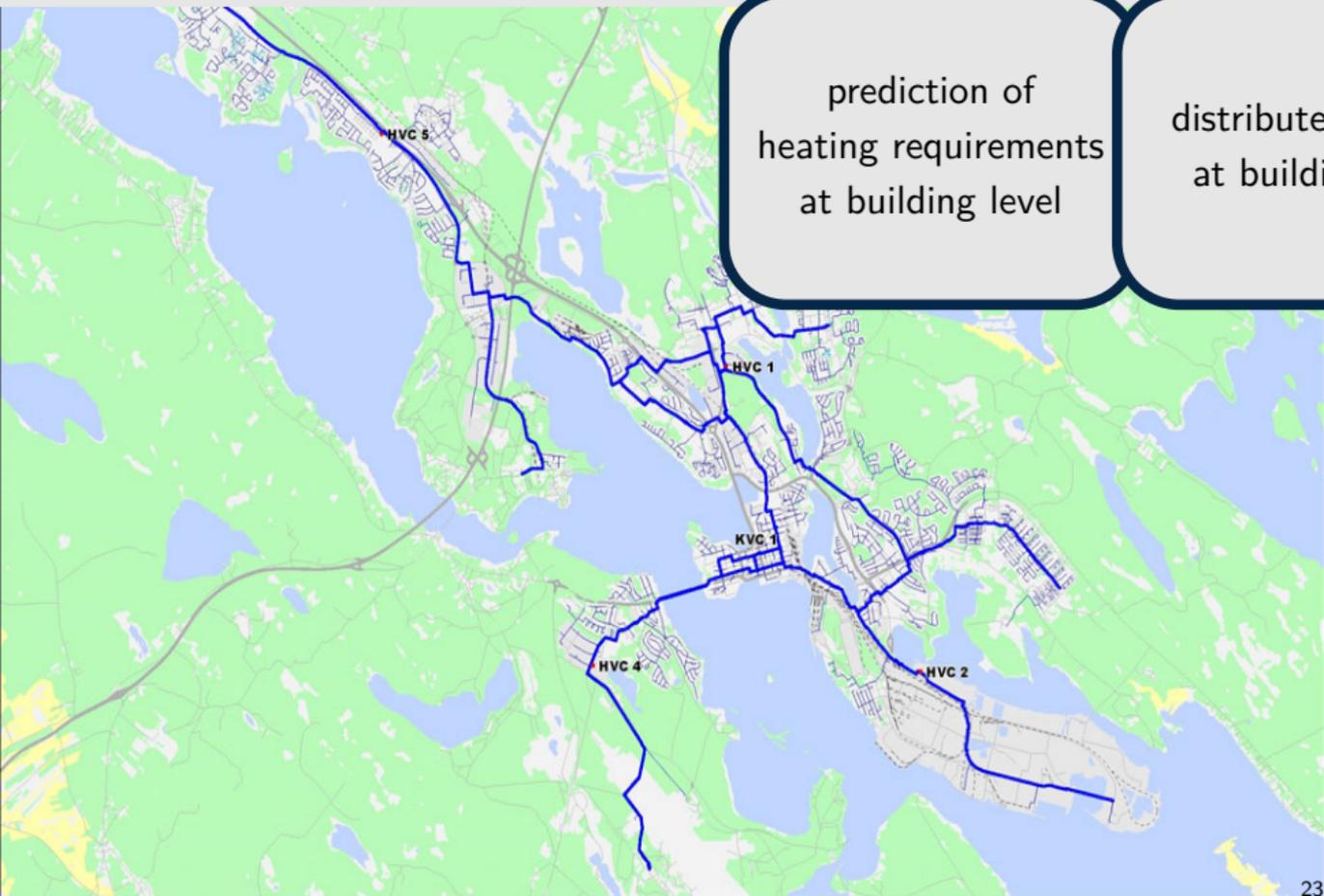
District heating for networks of buildings



District heating for networks of buildings



District heating for networks of buildings



prediction of
heating requirements
at building level

distributed
at building level

District heating for networks of buildings

synopsys: prediction of heating requirements, networked heating control, assessment of impact of forecasts uncertainties

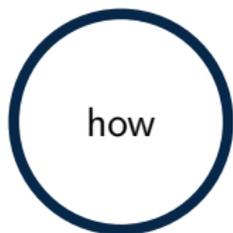
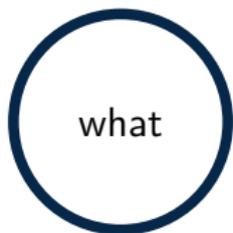
gaps in research frontier:

- no management of uncertainties in the forecasts
- no cooperation for diminishing stress on infrastructures
- no tests on real structures

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- towards future networked systems
- generally applicable research
- academically, extremely hot topic



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