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Advanced statistical methods for determining the hosting capacity of medium and low voltage networks

PhD student: Umar Hanif Ramadhani, umar.ramadhani@angstrom.uu.se

Supervisors: Joakim Widén and Joakim Munkhammar (UU),
Nicholas Etherden (Vattenfall)

Project funded by:





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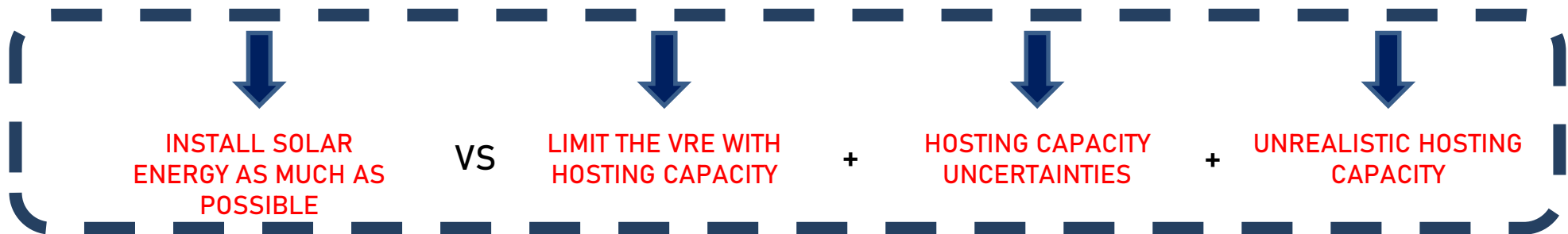
PROBLEMS

HIGH SOLAR ENERGY
TARGET IN SWEDISH
ELECTRICITY MIX

BAD IMPACTS OF VARIABLE
RENEWABLE ENERGY (VRE)
ON ELECTRICITY GRID

UNCERTAINTIES OF INPUT
VARIABLES IN LOAD FLOW
CALCULATION

UNCERTAINTIES OF
TECHNOLOGY DEPLOYMENT
AT THE GRID CUSTOMERS



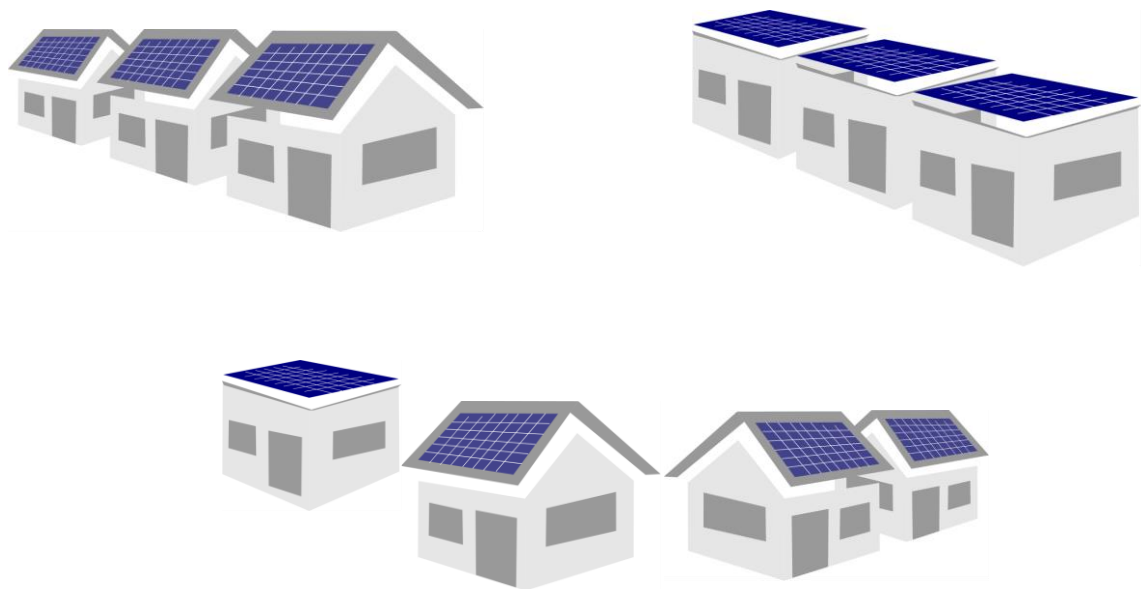


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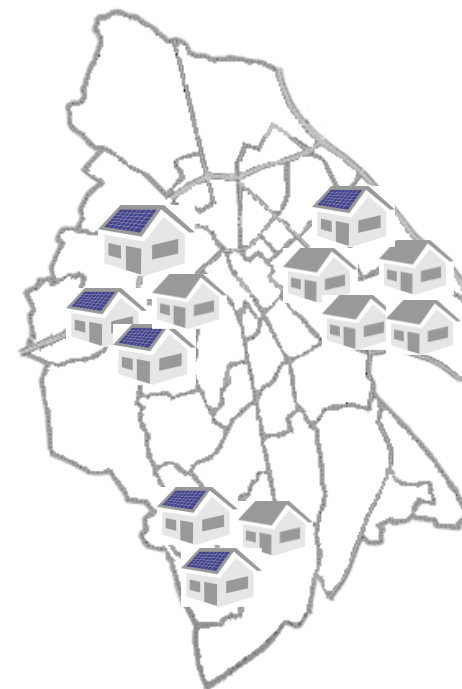
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DETAILED PROBLEMS

ORIENTATION AND TILT ARE OFTEN ASSUMED TO
BE UNIFORMLY FACED IN ONE DIRECTION.



NO INSIGHT INTO THE EXPECTED SPATIAL
SPREAD OF NEW RESIDENTIAL PV.





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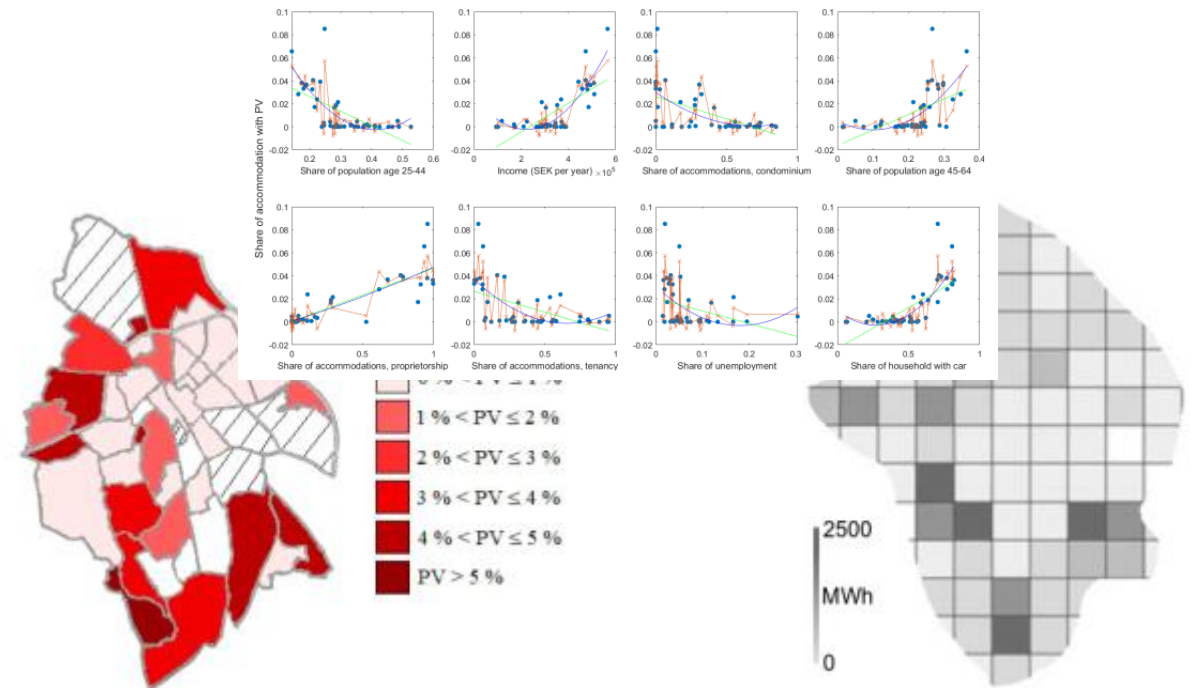
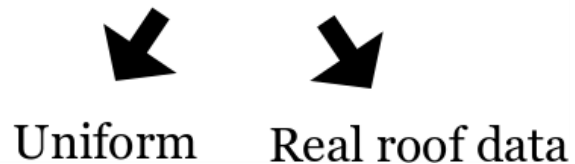
OBJECTIVES

- Analyze the rooftop profiles of single family houses
- Impact analysis of different methods of modelling single family house's rooftop
- Probabilistic adoption model considering socio-economic data and peer effects

APPROACHES



Hosting capacity analysis



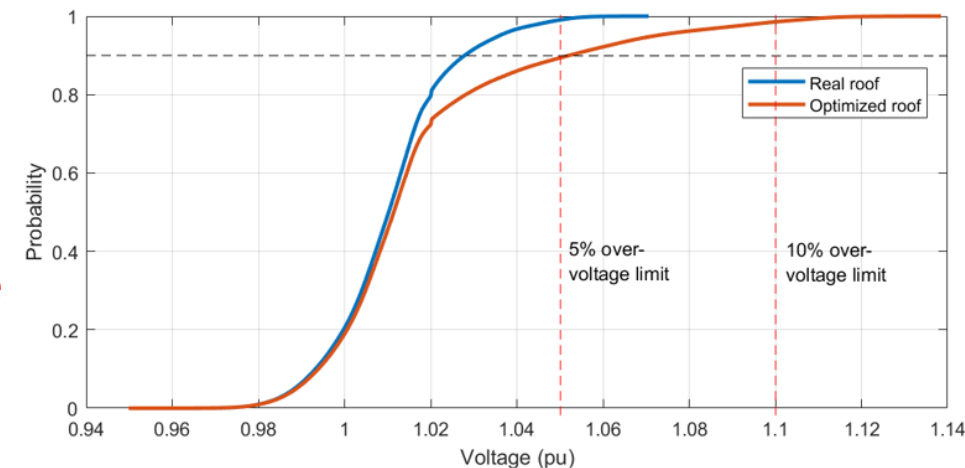
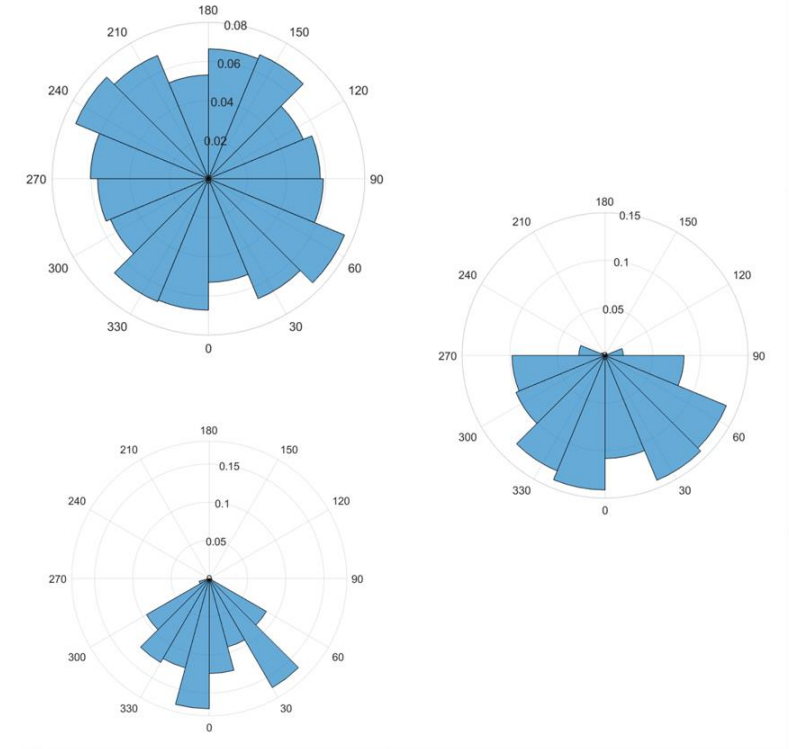


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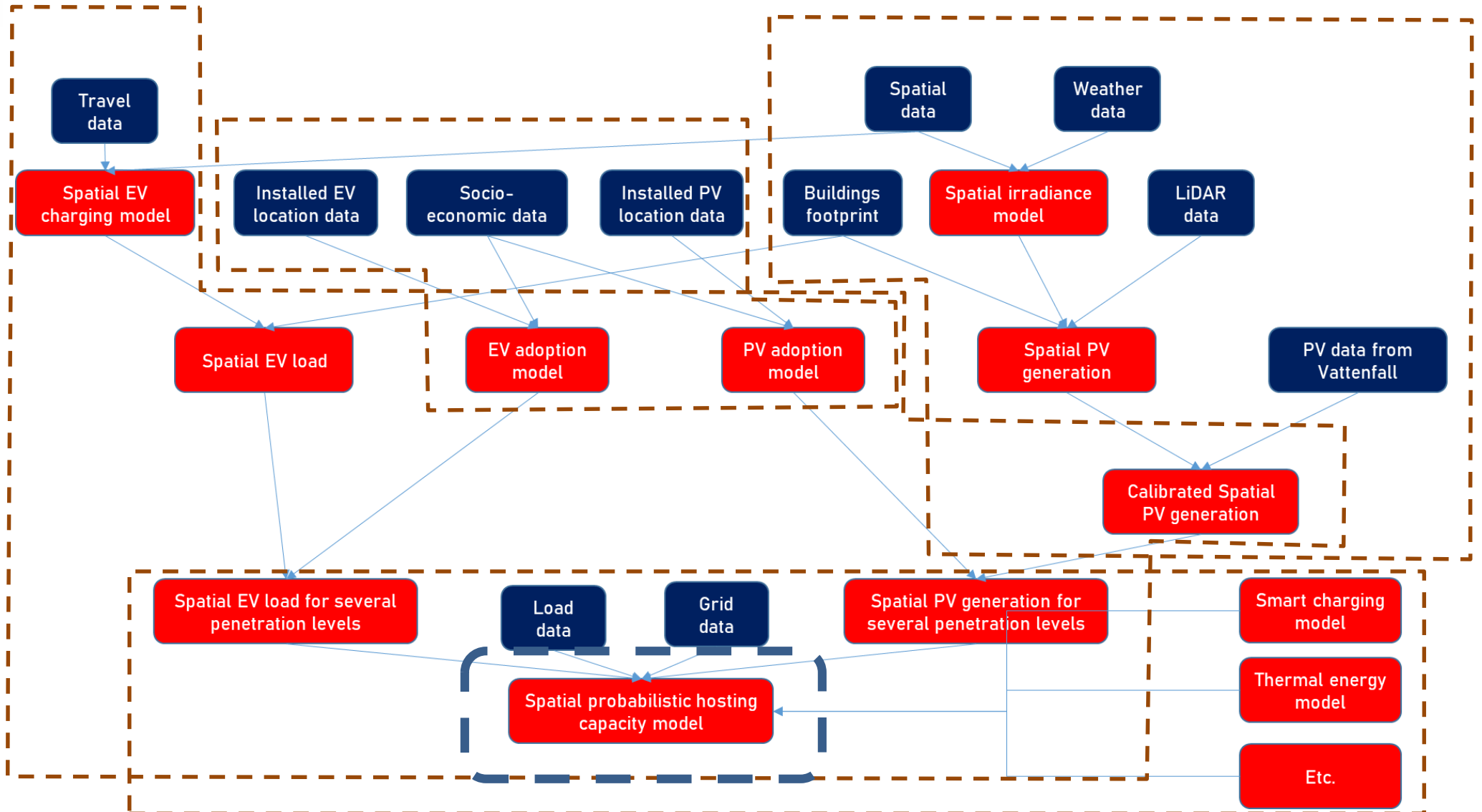
FINDINGS

- **Socio-economic drivers** of residential PV systems applied for in **Uppsala**: property ownership type, average income, share of households with cars, age group, unemployment rate. Some of the **factors differ from the previous studies** in different countries.
- A prediction is generated, districts with a high population of students are predicted to have a lower PV penetration. **Knowing local conditions is important.**
- A comparison to the solar generation potential **shows a good synergy between physical and socio-economic factors.**
- **Flat or optimized roofs assumption is not rational.** If the roof data are not available, a new better way to model it should be studied.
- High penetration of PV systems in residential houses may be **hampered by the availability of good roofs first**, before it reaches the hosting capacity.
- Optimized roofs assumption **overestimate the impact** of PV systems.





FUTURE WORKS





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THANK YOU!

contact: umar.ramadhani@angstrom.uu.se