

An approach to optimal control of snow melting systems

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Introduction and background:

Snow melting systems used for keeping areas surrounding commercial buildings are becoming common. These systems are often installed in relation with HVAC systems but compared to other systems for heating snow melting systems are highly power consuming. In addition, Snow melting systems are subject to periodic run time, as the need of snow melting is dependent on weather. To improve the control and optimize the use of predicted weather data it is desired to consider alternative control methods for snow melting systems.

Problem description and objective:

It is desired to research the feasibility of using MPC for control of snow melting systems. A suitable mathematical model for use in development of the MPC is to be derived. The model is to be fitted to historical measurement data gathered from the system in question, so that the model behavior represents the behavior of the real system. A MPC is to be developed based on the found model and tested against the existing control system. The MPC is to use weather forecast to optimize the control of the snow melting system. Finally an economical evaluation of the implementation cost and potential savings of using MPC for snow melting systems is to be conducted.



Candidate:

Tim Cato Lybekk

Telephone:

+47 911 34 223

Email:

Tim_cato@outlook.com