

Automatic container model crane

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Gruppe 633

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Agenda

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Improvements

Improvements



State estimation

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Improvements

2

- Modeling for additional outputs allows correction of the model using an estimator

2



State estimation

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Improvements

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- Modeling for additional outputs allows correction of the model using an estimator
- A multiple output model that adequately captures the dynamics of the system could be used in a Kalman filter to create a state estimate

2



State estimation

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Improvements

2

- Modeling for additional outputs allows correction of the model using an estimator
- A multiple output model that adequately captures the dynamics of the system could be used in a Kalman filter to create a state estimate
- The state estimates can be used in a state feedback loop to change system dynamics

State estimation

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Improvements

2

- Modeling for additional outputs allows correction of the model using an estimator
- A multiple output model that adequately captures the dynamics of the system could be used in a Kalman filter to create a state estimate
- The state estimates can be used in a state feedback loop to change system dynamics
- This means that reference following capabilities can be added to the system, despite the nonlinear characteristics of the dynamics

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State estimation

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Improvements

3

- The hypothesis was tested in simulation



State estimation

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Improvements

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- ▶ The hypothesis was tested in simulation
- ▶ Simulation results show that full reference following is possible despite the input nonlinearities in the system

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- ▶ Simulation results show that full reference following is possible despite the input nonlinearities in the system
- ▶ While the transient behaviour of the reference value is replicated, offsets and parasitic gains need to be compensated



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Improvements

Improvements



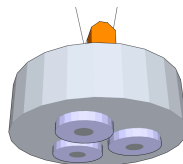
Optimering

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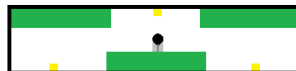
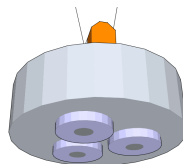
► Trolley

Improvements

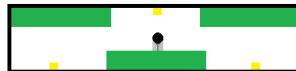
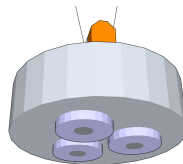
- ▶ Trolley
- ▶ Elektromagnet



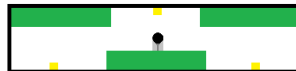
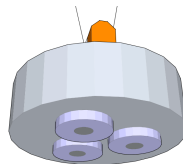
- ▶ Trolley
- ▶ Elektromagnet
- ▶ Vinkel sensor



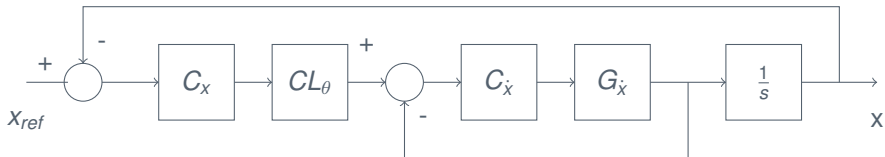
- ▶ Trolley
- ▶ Elektromagnet
- ▶ Vinkel sensor
- ▶ Approximation af container vægt



- ▶ Trolley
- ▶ Elektromagnet
- ▶ Vinkel sensor
- ▶ Approximation af container vægt
- ▶ Statisk friktion



► Statisk friktion





Konklusion

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Improvements

► Analyse af kran



Konklusion

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Improvements

- Analyse af kran
- Modeller er blevet udledt på baggrund af analyse



Konklusion

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Improvements

- ▶ Analyse af kran
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- ▶ Kaskade kobling



Demonstration

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► Kontrol lab

Improvements