

# Protocol Convex Optimization for 10T Feb 2020

Prof. Sergio Lucier

Other Protocol, other Day

topics: . What is a convex Problem?

. How did we define the optimization problem?

. What is the Lagrangian?

. What are the dual function / problem?

. What possibilities to solve them do we have?

We then talked about

- Gradient descent
- Newton method
- Line search

. What do we do:

KKT & ~~the~~ equality constraints

. How does interior point method work?

. What are linear for first order methods:

- Method of multipliers...

. What is the proximal operator and what does it do?

Possible to take in German



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# Protocol Convex Optimization for 10T

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. Definition convexity of functions / sets

↳ is Taylor First order approximate always good?

. Definition optimization problem

. Definition Lagrangian

. Definition dual problem

. KKT conditions

. How can we solve this?

. Definition iterative methods

↳ line search

↳  $\lambda$ : only scalar optimization

↳ how many optimization variables? (1)

↳ Newton step size = ...

. Conjugated gradient descent

. Fast gradient descent

. What to do if you have inequality constraints

↳ interior point method.

Possible to be tested in German.

line: ~15 min

if something is not clearly stated, we will ask you  
Bundestag to clarify it and maybe help a  
little bit



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little bit