Convex Optimization for Machine Learning and Computer Vision

Lecture: T. Wu
Exercises: E. Laude, T. Möllenhoff
Summer Semester 2017

Computer Vision Group
Institut für Informatik
Technische Universität München

Weekly Exercises 9

Room: 02.09.023
Monday, 10.07.2017, 12:15-14:00
Submission deadline: Wednesday, 05.07.2017, Room 02.09.023

Monotone Operators (6 Points)

Exercise 1 (6 Points)**.** Prove the theorem from the lecture:

Let C be a nonempty, closed, convex subset of $\mathbb{R}^n$. For each $i \in \{1, ..., m\}$, let $\alpha_i \in (0,1)$, $\omega_i \in (0,1)$ and $\Phi_i : C \to \mathbb{R}^n$ be an α_i-averaged operator. If $\sum_{i=1}^m \omega_i = 1$ and $\alpha = \max_{1 \leq i \leq m} \alpha_i$, then

$$\Phi = \sum_{i=1}^m \omega_i \Phi_i$$

is α-averaged.

Programming

Exercise 2. Finish the programming exercise from last week. The exact deadline for handing in the programming exercise is **July 5th, 2017, 23:59pm**.