Multiple View Geometry: Exercise Sheet 10

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`http://vision.in.tum.de/teaching/ss2016/mvg2016`

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Part I: Theory

1. Let $u : \Omega \subset \mathbb{R}^2 \to \mathbb{R}$ be a real valued function. And let E be a real valued Gâteaux differentiable functional given as:

$$E(u) = \int_\Omega \mathcal{L}(u(x), u'(x), u''(x)) \ dx.$$

   Derive the Euler-Lagrange equation!

2. Compute the Euler-Lagrange equation and the update step for u^{t+1} for the functional

$$E(u) = \frac{1}{2} \int_\Omega g(x) |\nabla u(x)|^2 dx \tag{1}$$

   where $\Omega \subset \mathbb{R}^2$ and $u, g : \Omega \to \mathbb{R}$.