

Differential Geometry III – Homework 12

Submission: February 13, 2019, 12:15 am

1. Exercise

(8 points)

Let M be a simply connected simplicial surface in \mathbb{R}^3 and $u \in S_h$. Further, let (M, \mathcal{F}) be a frame field as defined in the lecture. Consider the following energy:

$$E(u) = \int_M |\nabla u - X|^2 dA.$$

u is a critical point of $E(u)$ if and only if $\frac{d}{d\epsilon}|_{\epsilon=0} E(u + \epsilon\psi) = 0$ for all variations $\psi \in C_0^\infty(M)$. In the lecture, there was a matrix representation for the critical values derived. Formulate the described procedure in pseudocode.

Total: 8