

Differential Geometric Aspects in Image Processing

Dr. Marcelo Cárdenas

Classroom exercises: November 7, 2019

Problem C1.1

Show that a simple closed curve is strictly convex if and only if the turning angle ν is strictly monotone.

Problem C1.2

i) Show that the affine metric g is invariant under special affine transformations.

ii) Let $\tilde{c}(s) = Ac(s) + b$ be an affine transformation of c . Show that $\frac{d\tilde{s}}{ds} = (\det A)^{1/3}$.

Problem C1.3

Show that $GL(d, \mathbb{R})$ with the usual multiplication of matrices is a Lie group.