



Seminário de Mecânica & Geometria DMAT-UFPE

“Triedros que minimizam rotação”

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Resumo: The main goal of this work is to show how to exactly compute rotation minimizing frames for an at least three times differentiable space curve. Due to their minimal twist, these frames are preferable over the usual Frenet one in many contexts, such as in motion design, sweep surface modeling, computer visualization, and in geometric considerations as well. We show that it is possible to find the angle between the principal normal and a rotation minimizing vector. This is done by first solving the problem for spherical curves and then using the concept of osculating spheres to solve the general case. Finally, since Frenet frames and osculating spheres are not well defined at the zeros of the curvature and torsion, respectively, we discuss the behavior of the angle between the principal normal and a rotation minimizing vector near these zeros. For a curve whose torsion vanishes on intervals or isolated points only, we show that a rotation minimizing frame can be globally defined using our procedure by conveniently choosing some arbitrary constants. On the other hand, we mention that rotation minimizing frames can be well defined via their Frenet frames for analytic curves. Certainly, our approach will be of great importance in those contexts where rotation minimizing frames play a role.

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Local: DMat **Sala:** 208

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