



THE WORLDWIDE CENTER OF MATHEMATICS

Implicitization of surfaces via geometric tropicalization



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Coffee, tea, cookies: 3:30pm

Talk: 4-5pm

929 Massachusetts Ave., Cambridge, Suite #102

Abstract: Tropical geometry can be viewed as a polyhedral version of algebraic geometry: algebraic varieties are replaced by weighted balanced polyhedral complexes, in order to answer open questions or to derive simpler proofs of classical results. These objects preserve just enough data about the original varieties to remain meaningful, while discarding much of their complexity.

In this talk we discuss recent developments in tropical methods for implicitization of surfaces. This study was pioneered in the generic case by work of Sturmfels, Tevelev and Yu, and is based on the theory of geometric tropicalization, developed by Hacking, Keel and Tevelev. The latter hinges on computing the tropicalization of subvarieties of tori by analyzing the combinatorics of their boundary in a suitable (tropical) compactification. We enhance this theory by providing a formula for computing weights on tropical varieties, a key tool for tropical implicitization. Finally, we address the question of tropical implicitization for non-generic surfaces and illustrate our techniques with several numerical examples in 3-space.

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All attendees will need to sign a release form, as the lecture will be recorded for distribution on the Web.