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TITLE: Detecting Hidden Curves Using Algebraic Schemes

ABSTRACT: If you look at the following images, you might be tempted to recognize familiar curves. Can it be done? How? Is there any interest in doing this?



In recent years, particularly in problems of recognition of special shapes in medical and astronomical images, a lot of effort has been made to detect special objects. Piana and Massone are actively working on this topic and Beltrametti and I are formalizing the problem using tools from algebraic geometry.

We are able to extend the notion of Hough transform to algebraic schemes, in particular to space curves, and to characterize the notion of Hough regularity. The main idea is to parametrize the fibers of a flat family via the σ -reduced Gröbner basis.

In the seminar I will explain the connection between these two apparently disconnected worlds of images and algebraic geometry.