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Mathematics and CS Seminar

An arithmetic count of rational plane curves

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Host: Timothy Browning

There are finitely many degree d rational plane curves passing through 3d-1 points, and over the complex numbers, this number is independent of (generically) chosen points. For example, there are 12 degree 3 rational curves through 8 points, one conic passing through 5, and one line passing through 2. Over the real numbers, one can obtain a fixed number by weighting real rational curves by their Welschinger invariant, and work of Solomon identifies this invariant with a local degree. It is a feature of A1-homotopy theory that analogous real and complex results can indicate the presence of a common generalization, valid over a general field. We develop and compute an A1-degree, following Morel, of the evaluation map on Kontsevich moduli space to obtain an arithmetic count of rational plane curves, which is valid for any field k of characteristic not 2 or 3. This shows independence of the count on the choice of generically chosen points with fixed residue fields, strengthening a count of Marc Levine. This is joint work with Jesse Kass, Marc Levine, and Jake Solomon.

Thursday, January 14, 2021 03:00pm - 04:00pm

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