MATEMATISKA INSTITUTIONEN
STOCKHOLMS UNIVERSITET
Avd. Matematik

SJÄLVSTÄNDIGT ARBETE I MATEMATIK

Onsdagen den 10 november kl. 11.30–12.30 **(Obs!)** presenterar Henrik Treadup sitt arbete "Permutations of Roots of Complex Polynomials" (30 högskolepoäng, grundnivå).

Handledare: Torsten Ekedahl

Plats: Sal 31 **(Obs!)**, hus 5, Kräftriket

Abstract: A complex bivariate polynomial can be viewed as a continuous family of complex polynomials. If the parameter is moved along a continuous curve the roots of the generated polynomial will move along continuous curves. If the parameter is moved along a closed curve then each root will end up where it started except in the case when the curve goes around certain critical points. In this case the roots can swap places and the curve will generate a permutation of the roots.
The Predict Correct Algorithm can be used to numerically follow roots of the generated polynomial as the parameter is moved along a curve. A problem that can occur with the Predict Correct Algorithm is that the algorithm will jump and start following the wrong root. In this paper a modified version of the Predict Correct Algorithm is developed that guarantees that no root jumping occurs. The new algorithm is called the Predict Correct Verify Algorithm. An algorithm for calculating the critical points of a bivariate polynomial is presented.
An algorithm for automatically calculating all the permutations of the roots generated by a bivariate polynomial is developed. A program implementing the algorithm is written using the Scheme programming language.

Alla intresserade är välkomna!