



آگهی سخنرانی

Computational Galois Theory

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Abstract: The algebraic Galois theory is the "modern" theory of equations which began by the gold number to construct the pyramid of Khops around 2520 before J.C. and perhaps 10 000 years before J.C. for the temple of Andros.

Galois Theory consists to make possible the algebraic computations with the roots of an univariate polynomial f by using informations of a particular group, called the **Galois group** of f . This group was discovered by Evariste Galois inspired by ideas of Lagrange in its "Theory of equations" and also the particular aspect of solvability by radicals.

We can think that the origin of the modern computational Galois Theory comes from Lagrange. He has introduced the fundamental tool called **resolvent** to explain the distinct known methods which solve all equations by radical in degrees 3 and 4. He was thinking that by using its resolvents it is possible to prove that it is not possible for many polynomials after the degree 4. He was right. The resolvents of f also are univariate polynomials constructed from f and invariants of finite groups.

Another tool was recently introduced: **galoisian ideal** and **matrices of groups and partitions** which predict the Galois group and the degree of each irreducible factors of each resolvent of f in function of its possible Galois group et du groupe associated to the invariant. This presentation will expose methods to compute both the Galois group and the decomposition field of f (i.e. make algebraic computations with its roots) by using the resolvents of f , the Galois groups of f and of the irreducible factors of its resolvents, the matrices of partitions and groups and the galoisian ideals.

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