Title: Set valued polynomials and their application to robust localization of an underwater robot

Abstract: Many problems can be seen as constraint satisfaction problems. Sometimes, the CSP is over constrained and the solution is an empty set. This may be due to some constraints being inconsistent with the rest. In this case, one may try to find the relaxed solution i.e. the solution which satisfies only a part of the constraints. However, it is not easy to know the number of inconsistent constraints. This number may also vary with time. The approach consists on representing the solution of the problem in the form of polynomials with set-valued coefficients. Each coefficient represents the solution of the problem assuming a fixed number of inconsistent constraints. The advantage of that representation is that it is independent of the number of inconsistent constraints. Besides by taking benefit of polynomials arithmetic, one can manipulate the solution polynomials. As an example, this representation enables merging two solutions computed from two separate set of constraints into one solution. This may have some implications in distributed computations. In my talk I will present the set valued polynomials and an application to the dynamic localization of our robot Sauc'isse.