1077-14-2727 **Jon Yaggie*** (jyaggi2@uic.edu). *Variety of Finitely Generated k-algebra Homomorphisms.*

Let k be an algebraically closed field. Let A and B be arbitrary commutative (unitary) k-algebras. Assume $V \subset A$ and $W \subset B$ are finite dimensional k-linear subspaces. Denote the subalgebras of A and B generated by V and W as $A(V)$ and $B(W)$. Then the set $Hom(A, B, V, W)$ of k-algebra homomorphisms $f : A(V) \to B(W)$ such that $f(V) \subset W$ is an affine k-variety in a natural way. The structure of the proof of this claim suggests an algorithm could be developed to allow software to calculate the affine variety $Hom(A, B, V, W)$. The goal of my research is to develop software capable of doing this calculation and use this software to compute some classical algebras (e.g. group algebras, monomial algebras etc). Time permitting I will discuss specific applications of these algebraic sets. (Received September 22, 2011)