Meeting: 1001, Evanston, Illinois, SS 8A, Special Session on Computability Theory and Applications

1001-03-82 **Wesley Calvert***, Department of Mathematics, 255 Hurley Hall, University of Notre Dame, Notre Dame, IN 46556, and **Valentina Harizanov**, **Julia F. Knight** and **Sara Miller**.

Description and Comparison of Computable Structures. Preliminary report.

I will address two related questions which arise in computable model theory. First, given a computable structure, what is its simplest description, up to isomorphism? Second, given some class of computable structures, how difficult is it to distinguish nonisomorphic members?

In particular, let K be a class of computable structures, and let $I(K)$ denote the set of indices for members of K. We write $I(\mathcal{A})$ for the set of indices for a structure $\mathcal{A}$. Write $E(K)$ for the set of ordered pairs from $I(K)$ which index isomorphic members of K. Now, if $\mathcal{A}$ is computable, $I(\mathcal{A})$ is Σ^1_1, and if $I(K)$ is hyperarithmetical, then $E(K)$ is Σ^1_1.

Often when $E(K)$ is complete at some level (for instance, Π^0_3), this completeness is witnessed by $I(\mathcal{A})$ for some $\mathcal{A} \in K$. It is interesting to explore when there is such a witness. It is also interesting that for some K, any member will work as such a witness. Several examples will be given to illustrate these phenomena. (Received August 10, 2004)