



Illinois Wesleyan University
Digital Commons @ IWU

John Wesley Powell Student Research
Conference

1990, 1st Annual JWP Conference

Apr 6th, 6:30 PM - 8:00 PM

NP-Complete Problems in Linear Algebra

Santhosh R. Sastry
Illinois Wesleyan University

Melvyn Jeter, Faculty Advisor
Illinois Wesleyan University

Follow this and additional works at: <https://digitalcommons.iwu.edu/jwprc>

Sastry, Santhosh R. and Jeter, Faculty Advisor, Melvyn, "NP-Complete Problems in Linear Algebra" (1990). *John Wesley Powell Student Research Conference*. 23.
<https://digitalcommons.iwu.edu/jwprc/1990/posters/23>

This Event is protected by copyright and/or related rights. It has been brought to you by Digital Commons @ IWU with permission from the rights-holder(s). You are free to use this material in any way that is permitted by the copyright and related rights legislation that applies to your use. For other uses you need to obtain permission from the rights-holder(s) directly, unless additional rights are indicated by a Creative Commons license in the record and/ or on the work itself. This material has been accepted for inclusion by faculty at Illinois Wesleyan University. For more information, please contact digitalcommons@iwu.edu.

©Copyright is owned by the author of this document.

NP-COMPLETE PROBLEMS IN LINEAR ALGEBRA

Santhosh R. Sastry, Dept. of Mathematics, IWU, Melvyn Jeter*

This research project aims at proving NP-Complete results. Before defining NP-Completeness, background information about computability, Turing machines, time complexity etc. is provided.

The introductory part lays the basic definitions and the terminology is introduced. The next part deals with strings and encoding schemes. Turing machines and problems solvable in polynomial time are discussed before moving on to nondeterminism. The class NP is defined and the relationship between the two classes is dealt with. The class NP-Complete is then defined. A few problems shown to be NP-Complete.

This class of problems is important because, when it is shown that a problem is NP-Complete, we may wish to stop trying to find an efficient algorithm for it. Instead, we may try to find an algorithm for a special instance or come up with an approximation algorithm.

Key terms: Decision problem, string, formal language, encoding scheme, intractable problems, uncomputable problems, Deterministic Turing Machine (DTM), polynomial time, Class P, Nondeterministic Turing Machine (NDTM), Nondeterministic Polynomial time, Class NP, polynomial transformation, NP-Completeness.