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NISHANT MISRA

HOW DO SOCIETIES DECIDE? AN INTRODUCTION TO SOCIAL CHOICE

BORNIK ROYCHOWDHURY

WHEN LOGIC MEETS LIMITS: THE SAT PROBLEM

REFRESHMENTS WILL BE PROVIDED ON 19TH NOVEMBER 2025, 8:00 PM AT B011

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WHEN LOGIC MEETS LIMITS: THE SAT PROBLEM

A SIMPLE YES-OR-NO QUESTION THAT RESHAPED ARTIFICIAL INTELLIGENCE — THE BOOLEAN SATISFIABILITY PROBLEM (SAT) DEFINES THE LIMITS OF WHAT COMPUTERS CAN DO. AS THE FIRST NP-COMPLETE PROBLEM, IT BRIDGES LOGIC, MATHEMATICS, AND ALGORITHMS, AND DESPITE ITS SIMPLICITY, IT POWERS MODERN ADVANCES IN AI, VERIFICATION, CRYPTOGRAPHY, AND BEYOND. IN THIS TALK, I'LL INTRODUCE THE SAT PROBLEM AND EXPLORE SOME OF THE ELEGANT IDEAS AND ALGORITHMS THAT LIE AT THE HEART OF TODAY'S POWERFUL SAT SOLVERS.

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HOW DO SOCIETIES DECIDE? AN INTRODUCTION TO SOCIAL CHOICE

ECONOMISTS ARE PEOPLE PLEASERS. YET, AN OBSESSION OF THE DISCIPLINE IS A CATEGORY OF RESULTS WHICH TELL US IT'S BASICALLY IMPOSSIBLE TO KEEP EVERYONE HAPPY. CAN A SOCIETY CREDIBLY INCORPORATE EVERYONE'S PRIORITIES WHEN MAKING DECISIONS AND WHAT PRINCIPLES SHOULD ITS DECISIONS FOLLOW? AND CAN MATH HELP? I WILL NOT ANSWER THESE QUESTIONS. THE POINT HERE IS TO MAKE ACCESSIBLE A BRANCH OF ECONOMICS CALLED SOCIAL CHOICE THEORY IN WAYS SUCH THAT EVERYONE IS ABLE TO APPLY ITS PRINCIPLES. ALTHOUGH I SHALL DEAL WITH FUNDAMENTAL RESULTS IN THE FIELD , THESE WILL BE THOUGHT OF AS ILLUSTRATIVE EXAMPLES IN REASONING ABOUT COLLECTIVE CHOICE. THE FOCUS IS ON THE "BEHIND THE SCENES" OF THESE DRAMATIC RESULTS.

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