



Brainstorming on research topics

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Scenario: Suggest capstone course research topic

---- Copy and paste into our virtual CS373 assistant ----

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Prompt

Based on the following information about me, generate a list of 3 possible research topics for the state-of-the-field project that I could pursue that would help me succeed in the course

My coursework: Intro to computer science, software development, algorithms, computer organization, databases, computer ethics, agile software development, differential and integral calculus, intro psychology, intro social science

My Interests: Computer gaming, chess, baseball, new ideas in technology

Things I don't find interesting: Cooking, sophisticated movies, loud music

Give me details about why each topic would be a good choice. Give me specific details about what algorithms I would need to learn to do a good job

Virtual assistant response

Based on your coursework and interests, here are three potential research topics for your state-of-the-field project in the CSCI 373 course, along with justifications and relevant algorithms you would need to learn:

Artificial Intelligence in Computer Gaming:

Relevance: Your interest in computer gaming aligns perfectly with this topic. The field of AI in gaming is rapidly evolving and offers a plethora of research opportunities.

Coursework Connection: Your background in algorithms and software development will be crucial in understanding and developing AI systems for games.

Algorithms to Learn:

Pathfinding Algorithms (e.g., A*, Dijkstra's algorithm) for NPC movement.

Decision Trees and Machine Learning algorithms for adaptive and intelligent NPC behavior.

Reinforcement Learning for dynamic game balancing and NPC skill adjustment.

Data Analysis in Sports: A Focus on Baseball:

Relevance: Merging your interest in baseball with your computing skills could lead to fascinating insights in sports analytics, a field that's gaining immense popularity.

Coursework Connection: Your knowledge from databases, algorithms, and introductory courses in social sciences and psychology could be valuable in understanding and analyzing player statistics, team strategies, and fan psychology.

Algorithms to Learn:

Regression Analysis and Time Series Analysis for performance prediction and trend analysis.

Clustering Algorithms (e.g., K-Means) for player segmentation based on performance metrics.

Association Rule Learning for discovering interesting relations between different statistics.

Chess Engine Development and Optimization:

Relevance: As a chess enthusiast, you would find it rewarding to delve into the computational aspects of chess engines, exploring how computers simulate and strategize the game.

Coursework Connection: Your skills in algorithms and computer organization would be directly applicable in understanding and improving chess engine performance.

Algorithms to Learn:

Minimax Algorithm with Alpha-Beta Pruning for decision-making in chess.

Evaluation Functions for assessing chessboard positions.

Machine Learning techniques for strategic play based on historical game data.

Each of these topics leverages your academic background and personal interests, providing a rich ground for a comprehensive and engaging state-of-the-field project. The specific algorithms mentioned are integral to these areas and will enhance your understanding and ability to conduct in-depth research.