Csci6330: Advanced Database Design, Fall 2004
Spatial Data Management
TR, 10:00am-11:20am, NTRP B 190

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<th>Role</th>
<th>Name</th>
<th>Phone</th>
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<tr>
<td>Instructor</td>
<td>Prof. Yan Huang</td>
<td>369-8353</td>
<td><a href="mailto:huangyan@cs.unt.edu">huangyan@cs.unt.edu</a></td>
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Office Hours: TR, 8:55am – 9:55am, NTRP F251


Course Description: This course treats a specific advanced topic of current research interest in the area of spatial data and information. The main objective of this class is to study research methods and literature in spatial database systems. Core research skills of literature analysis, innovation, evaluation of new ideas, and communication are emphasized via homework and projects. Most students may like to get a broad overview of the research topics, methodologies, major results, open problems and potential future directions. Topics include: (1) Introduction to Spatial Databases, (2) Spatial Concepts and Data Models, (3) Spatial Query Languages: OGIS, SQL3, (4) Spatial Storage and Indexing: R-tree, Grid files, (5) Query Processing and Optimization: strategies for range query, nearest neighbor query, spatial joins (e.g. tree matching), cost models for new strategies, impact on rule based optimization, (6) Spatial Networks: Query language for graphs, graph algorithms, access methods, (7) Introduction to Spatial Data Mining: spatial auto-correlation, co-location patterns, spatial outliers, and classification method, (8) Trends in Spatial Databases: mobile wireless applications, spatio-temporal data.

Supplement:
1. A collection of research papers
2. Spatial Databases: with application to GIS, Philippe Rigaux, Michel Scholl, and Agnes Voisard, ISBN 1558605886

Examinations and Assignments: There will several paper analysis and one course project. The evaluation scheme will be class participation and in-class quiz – 20%, paper analysis and presentation – 30%, and final project (presentation and written report) – 50%. Potential sources for the paper would be conference proceedings for SIGMOD, VLDB, ICDE, CIKM, SIGKDD journals such as ACM TODS, IEEE TKDE, VLDB Journal, Information Systems, KDD journal etc.