(Graduate Special Design IV)

"Super School District": Child-Friendly Urban Design in the AI Era

Course Leader
Tu Huijun
Teaching Team
Tu Huijun, Dai Songhua, Li Jiangfeng (School of Computer Science)
Class Time
Thursday afternoons, Periods 5-8; Final presentation: June 13th, afternoons Periods 5-8.
4×16 weeks
Class Location
Building D, Room D3
Course Leader Information
- Name: Tu Huijun
- Email: tscut@126.com
- WeChat: tuhjtj

Course Overview

This course directly addresses the intertwined issues of "educational involution", "loss of childhood spaces", and "declining community vitality" in China's high-density cities. In the AI era, both educational concepts and childhood development paradigms will undergo profound transformations. We propose that the "Super School District" is not merely an educational facility planning concept, but a future social experiment centered on children's growth, reshaping the basic units of urban life.

Students will face a core challenge: Within a typical urban land parcel of 1500m × 1500m (approximately 2.25 square kilometers), how to go beyond the single indicator of service radius to create a comprehensive living environment that simultaneously meets the needs of safe walking, joyful growth, social integration, and family support? The design must integrate spatial design, social planning, and AI intelligent technology to respond to the following core issues:

1. **Protection of Spatial Rights**: How to construct a "learning path network" and activity system that allows children to explore the entire community independently, safely, and joyfully?

2. **Reduction of Social Costs**: How to systematically reduce families' commuting, caregiving, and educational anxieties through spatial and institutional design (such as shared campuses and mixed functions), providing greater peace of mind for parents?

3. **Construction of Growth Ecosystem**: How to create an "all-age-friendly" environment that seamlessly connects early childhood, school-age, and adolescent stages, encouraging social interaction and contact with nature?

4. **Practice of Technological Ethics**: How to leverage AI, big data, and other technologies as tools to empower children's safety, community interaction, and personalized growth?

Course Introduction

Phase 1: Cognition and Research – Problem Mapping and Vision Building (3 weeks)

This phase aims to eliminate subjective assumptions, accurately define problems through AI-assisted multi-dimensional research tools, and complete the transformation from "problem identification" to "planning".

Core Task

Produce a report titled *Diagnosis and Vision Planning of "Super School District" in the AI Era*.
Integration of Research Tools

- **On-site Mapping**: Draw maps of current children's activity hotspots, safety risk points, and gaps in public service facilities.
- **Multi-stakeholder Interviews**: Conduct in-depth interviews with children (through participatory drawing and game-based interviews), parents, teachers, and community workers to understand the pain points and expectations of all parties.
- **Big Data Assistance**: Use open-source data (such as POI and traffic flow) to analyze job-housing relationships, commuting routes, and public space usage patterns.
- **Case Decoding**: Study the underlying logic of child-friendly communities at home and abroad (e.g., "Children's Cycling City" in Delft, Netherlands; Kashiwa-no-ha Smart City in Japan).

Core Deliverables

1. A clear system of design objectives;
2. Evidence-based core spatial strategies such as "shared campus", "learning path network", and "age-segmented activity zones";
3. Preliminary conceptual planning of land use functions.

Phase 2: Planning and Layout – System Integration and Model Construction (4 weeks)

This phase transforms the plan into a specific spatial structure, conducting systematic layout within the 1500m × 1500m land parcel to balance norms, functions, and innovation.

Core Task

Complete *Master Plan and Conceptual Model of "Super School District" System in the AI Era*.
Key Design Focus Areas

- **Creative Satisfaction of Service Radius**: Within the 1500m × 1500m area, cleverly layout 1 junior high school, 3 primary schools, and several kindergartens/nurseries. Optimize the actual walking experience through "learning paths" rather than simply meeting straight-line distance requirements.
- **Integration of 15-Minute Living Circle Functions**: Organically embed commercial, cultural, sports, medical, and other facilities into residential clusters and along learning paths to form a convenient "doorstep" network.
- **Priority to "Child-Friendly" Structure**: Establish a spatial structure with "green

learning paths" as the framework, "community courtyards" as the basic units, and "shared campuses" as anchor points. Initially plan a pedestrian-vehicle separation system, major public space nodes, and potential areas for three-dimensional development such as "rooftop/sunken spaces".

Core Deliverables
1. Planning structure diagram;
2. Transportation system planning diagram;
3. Functional system planning diagram;
4. Physical/digital conceptual model reflecting structural relationships.

Phase 3: Urban Design – Form Shaping and Guidelines Compilation (3 weeks)

This phase endows the plan with specific spatial forms and qualities, and formulates design rules to ensure the implementation of the concept.

Core Task
Complete *Urban Design Drawings and Guidelines for "Super School District" in the AI Era*.
In-depth Application of Design Concepts
- **"Alleys and Courtyards"**: Design a small-scale, highly interesting pedestrian-vehicle separated street network connecting various "community courtyards" (mixed residential and micro-functions) to create a safe and intimate neighborhood environment.
- **Materialization of "Shared Campus"**: Design physical interfaces and operation time schemes for school facilities such as stadiums, libraries, and specialized classrooms to be shared with the community, and draw a "shared vitality calendar".
- **Deepening of "Learning Path Network"**: Consider innovative models such as three-dimensional transportation, continuous "weather-protected corridors", and safe commuting facilities for school children to create an all-weather safe path. Combine the concept of "digital twin" to explore further AI-assisted design.
- **"Multi-level Venues"**: Specifically design a hierarchical system of venues that encourage children's social interaction and participation, from front-yard playgrounds and pocket parks to street-level children's activity centers, meeting the needs of age-segmented activities.

Core Deliverables
1. Urban design master plan;
2. Cross-sections and effect diagrams of typical streets, interfaces, and public spaces;
3. *Child-Friendly Urban Design Guidelines* (considering control of street aspect ratio, building line rate, ground-floor functions, landscape elements, etc., based on core concepts).

Phase 4: Nodes and Mechanisms – Spatial Deepening and Institutional Innovation (4 weeks)

This phase involves in-depth design of key nodes and explores the

"soft" institutions supporting spatial operation.

Core Task

Complete *In-depth Design of Key Nodes and Operation Planning Scheme for "Super School District".*

In-depth Design Content (Based on Innovative Models from Previous Phases, for Reference)

- **Selection of Key Nodes**: Such as critical intersections of "learning paths", shared boundary areas of a school, or a "courtyard center" integrating childcare and community living room functions.
- **"One-Meter Height" Design**: Complete detailed design of node spaces from a child's perspective.
- **Nature Education Spaces**: Design participatory and explorable ecological nodes (such as community farms and wetland gardens).

Upper-Level Institutional Design (Based on Innovative Models from Previous Phases, for Reference)

- Devise a mechanism for a "Community Children's Council" to participate in design and maintenance.
- Plan reservation, management, and insurance systems for "shared campus facilities".
- Envision a digital platform-based "children's safety guardianship" and "activity release" system.
- Explore spatial carrying and operation models for services supporting "parents' peace of mind at work", such as after-school care, community mutual care, and "boundaryless play spaces".

Core Deliverables

1. Detailed floor plans, elevations, sections, and scene renderings of nodes (AI assistance is encouraged), as well as physical models or AI-generated videos to demonstrate design concepts;
2. *Upper-Level Design and Operation Planning for Co-construction, Co-governance, and Sharing of "Super School District" in the AI Era.*

Phase 5: Design Review and Exchange (2 weeks)

Final Review Requirements

Students must integrate the results of the four phases to present a comprehensive proposal for the "Super School District" covering problem analysis, system planning, spatial design, and operation mechanisms. A public defense involving multi-stakeholder judges (including child judges and AI judges) will be held on the afternoon of June 13th (tentative). After the defense, revise and improve the drawings and submit the final results on June 18th (tentative).

Basic Content of Design Research

This design research requires students to take "children's growth in the AI era" as the core and complete a conceptual urban design of a future-oriented "Super School District" within a simulated urban land parcel of 1500m × 1500m.

The core challenge is to go beyond norms and systematically address the four major issues of children's safe and independent travel, family support, all-age-friendly growth, and

technological ethics through the integration of spatial design, social planning, and intelligent technology.

The core tasks involve two major innovative integrations:

1. **Spatial Model Integration**: Reconstruct the transportation system, establish a non-motorized framework dominated by a safe, continuous, and interesting "innovative learning path network", connecting 1 junior high school, 3 primary schools, and complete community functions to realize truly child-friendly travel.
2. **Technical Method Integration**: Deeply integrate AI technology throughout the process, from big data analysis and generative design to operation simulation, to achieve data-driven and intelligent planning decisions, and conceive a child-friendly platform supporting sharing and safety.

The research content will be carried out in four phases: 1) Problem diagnosis and vision planning through multi-dimensional research; 2) System planning and functional layout with the "learning path network" as the framework; 3) Form design and compilation of child-friendly guidelines; 4) In-depth design of key nodes and innovation of community sharing and operation mechanisms with top-level planning.

The ultimate goal is to produce a comprehensive proposal for the "Super School District" from problem analysis to spatial creation and institutional innovation, aiming to guide students to complete a comprehensive training from technical drawings to social design, and from spatial shaping to institutional innovation, truly practicing the future design value of "leading urban goodness through child-friendliness".

Appendix: Previous Years' Course Final Review Records

https://mp.weixin.qq.com/s/CQke8cyQxRmdQllM7SsCsg

https://mp.weixin.qq.com/s/i3mRb_LWs1NaI2lCBe2d3A

https://mp.weixin.qq.com/s/ZX1OHELE8az95FGVsCXhZg