

# Research Project: *The Comfort Experience*

Richard Appleby + Richard Hay

## X+ Experience & Interaction Lab

*Lab Leader: Mengjie Huang*

### Project Description:

The aims and objectives of this project considers the health problems that are sustained from badly designed seating and poor sitting postures, within the working and domestic environments. Now we propose the development of more intelligent interactive chair systems, that can sense and monitor variable human seating positions, then with physical feedback and robotic adjustment can achieve a more comfortable and ergonomically improved seating support.

This research approach recognizes that there are many human 'resting' positions that can damage our physical health and well-being, that could benefit from intelligent adaptive systems in the home and work contexts. We will consider how simple visual and haptic feedback can improve behavioral awareness, particularly for sedentary users.

With the expertise of a project team approach working in collaboration, will benefit from the academic experience to complete the quantitative and qualitative analysis of existing typologies, together with design and prototyping skills to evaluate new hypothetical design concepts and structures, that improve the comfort experience. Collaboration across the IND and ARC departments will provide the broader knowledge and skills to motivate further research opportunities within the same framework and context.

**Research Publication:** Journal Article to include the following activities:

1. Publications will assimilate the current research knowledge in this field, literature review, product benchmarks, current manufacturing standards and regulations, safety standards, potential technologies, etc., to map the success and failure of the current seating and ergonomic positions. This will be followed by more empirical research methodologies and specific user tests to evaluate human interaction with contemporary chair systems. This will include both **quantitative analysis** of existing chairs and the **qualitative measurement** of particular seating scenarios and contexts (at work, at home, etc). This will also produce the 'comfort experience framework' used to evaluate new concepts (2)

2. Development and **Exhibition of New Design Concepts** for new transformative seating and resting systems. Materially, this will take the form of full-size experimental structures which follow an iterative and reflective process of making, reflection and re-making, as a **Practice-based** research process where design options are explored, discovered and evaluated within the same framework.

3. **Prototype Design:** 3D Model and Adaptive Systems development for a working Prototype build to user-test the physical structure and digital system interaction. At this stage digital prototypes may also be created within a VR environment to test aspects of the user experience. Respondents will be chosen in a similar way to the tests in the original contemporary chair evaluations so a direct comparison of experiences can be

evaluated. This will be reported and developed as a 2<sup>nd</sup> Journal article, + Manufacturing Specification + if appropriate - Patent

**Collaborative Partner(s):**

**T-LAB Furniture Manufacturing**

Room 201,2F,1226 South Shenbin Road, Noah Center, Minhang District, Shanghai,  
上海闵行区申滨南路1226号诺亚财富中心C栋201室

T-LAB is a multifunctional group providing integrated services for all kinds of decoration space, providing professional services including high-end commercial space planning, construction management, consulting services, foreign procurement, commercial prop research and development, manufacturing, overall customization of high- end furniture, and project research. T-LAB also have a professional design, R&D, manufacturing and construction team and committed to build the overall space in the high-end commercial field. We helped high-end retailers build boutiques in department stores like Beijing SKP, SKP-S, Xi'an SKP , etc. We also provides professional services for world famous brands, high class hotels, delicate office spaces, restaurants etc.

**Project Activities:**

	Activity	People: IND staff / Partner staff
<b>Stage 1</b>	Research Exploration to compare the current Furniture fixtures within a similar context and market. Visits to the manufacturers and materials research to define interesting new opportunities for research hypotheses.	XJTLU Industrial design with meetings with T-LAB
	<b>Outcome</b>	<b>Journal Paper</b>
<b>Stage 2</b>	Development and Exhibition of New Design Concepts for new transformative seating and resting systems.	Design research concept s materials experiments with T-LAB
	<b>Outcome</b>	<b>Exhibitions + test analysis statistics and data</b>
<b>Stage 3</b>	Prototype Design to test the mechanical function and lighting, + Design Data (CAD)	Writing up the user test analysis and technology development, completing Manufacturing specification and journal publication. / Patent
	<b>Outcome</b>	<b>Journal Paper + Patent Manufacturing Specification</b>

### **Estimated Budget**

Travel Costs  
Subsistence

4 x staff return visits to Where?? Province = xxxxx  
Hotels and Food =

Materials Costs

Materials expenses and prototypes will  
be provided by **T-LAB**

### **Contacts:**

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Richard Hay  
Research Team  
XJTLU Resources  
**T LAB Manufacturing**

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TBD Technicians  
Lab Research Space + DB FabLab Workshops  
**Prototype Materials + Constructions**  
*(+ Intelligent adaptive systems ?)*

**Richard Appleby**  
IND Research Director  
Date

**Roger Lo**  
IND Head of Department  
Date

## Project Planning / Dates / Meetings / Reviews / etc

	Activity	Estimated Outcome + Date
<b>Stage 1</b>	Research Exploration	<b>June/2024</b>
	<b>Outcome</b>	Research Report
<b>Stage 2</b>	Concept development and User testing	<b>Aug/2024</b>
	<b>Outcome</b>	Design presentations + test analysis
<b>Stage 3</b>	Detail Development of prototypes	<b>Oct/2024</b>
	<b>Outcome</b>	Prototype with functioning lighting,
<b>Stage 4</b>	Journal Paper + Design Data (CAD)	<b>Dec/2025</b>
	<b>Outcome</b>	Publication of Paper + Patent Manufacturing Specification