



極限學習過程

國際暑期項目

INTERNATIONAL SUMMER PROGRAM



SUSTAINABLE DIGITAL NATION

AUGUST 2013 TO SEPTEMBER 2013

ORGANIZERS:



toyhouse
Learn by Playing



SUTD-MIT
INTERNATIONAL
DESIGN
CENTRE

Undertake the impossible,
Design the unexpected.

TSINGHUA UNIVERSITY OFFICE OF INTERNATIONAL COOPERATION & EXCHANGE | TSINGHUA
UNIVERSITY OFFICE OF ACADEMIC AFFAIRS | TSINGHUA UNIVERSITY GRADUATE
SCHOOL | CENTER FOR NANO AND MICRO MECHANICS | RENMIN UNIVERSITY OF CHINA

ABOUT TOYHOUSE



Founded in year 2007 by Professor Benjamin Koo Hsueh-Yung, Toyhouse is dedicated as a research center for informal learning methodology as well as for practical work flow system organization. Now, Toyhouse has become a meeting point for individuals from all around the world who are keen in teaching or learning.

With network information technology and computer science incorporated to conventional management systems, Toyhouse reproduce learning strategy from traditional pedagogy. These methods are well used in different institutes of different courses in Tsinghua University.

Since its inception, Toyhouse has been and still collaborates with key personnels from the Tsinghua University's Department of Industrial Engineering, Beijing Jiaotong University Software College as well as other industrial training centers. The activities and its outcome are highly recognized by people from University of Alaska, Columbia University, Singapore University of Technology and Design, Lego Group and Chinese Higher Education Press.

CONTACT INFO



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ABOUT EXTREME LEARNING PROCESS (XLP)

XLP is a theoretical learning concept that is structured according to distributed learning work flow that integrates informatics technology and campus operation management.

XLP's curriculum is planned by professionals by utilizing various teaching resources and available teaching tools. Through teamwork among members and the knowledge on known learning mechanism, XLP aims to breakthrough traditional pedagogy ideals by carrying out new models of education.



STORYLINE



We live in a digital nation where calculation and computation exist in every corner of our society.

Through XLP, children and parents will discover the beauty of ancient Chinese figures from the perspective of its traditional culture. The challengers has designed various activities with the notion of Chinese culture and digitization in mind. Through the activities, participants get to understand the five elements that has always been the foundation of nature as well as its relationship. From the perspective of Chinese Traditional Medical, we can analyze our lifestyle behavior. From the perspective of Chinese military concept, we can design interesting games. During the last three days of the event, children gets to collate the experiences from the beginning and create their own projects with digital tools.

Let us embark on a journey that speaks of the wonderful combination of Chinese traditional culture and modern digitization.

SCHEDULE



August 10th

0900	Visit to Zhi Hua Temple
1200	Lunch
1400	Make your own musical instrument
1730	Design Lesson
1800	End

August 11th

0900	Dumpling Making Session
1200	Lunch
1400	Make your own refrigeration machine
1730	Summary
1800	End

August 12th

0900	Visit to Planetarium
1300	Lunch
1400	Make your own LEGO® Earth-Moon System
1730	Summary
1800	End

August 13th

0900	Visit to Summer Palace
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1100 Picnic
1400 Make your own 3D printable building
1730 Summary
1800 End

August 14th
0800 Visit to Phoenix Ridge, West of Beijing
1000 Traditional Chinese Medical Lesson
1200 Lunch
1400 Chinese Herbology Lesson
1730 Summary
1800 End

August 15th
0900 Visit to Gaming Company
1200 Lunch
1400 Design Lesson & Technical Lesson
1730 Summary
1800 End

August 16th
0900 Design Lesson
1200 Lunch
1400 Build your own project
1730 Summary
1800 End

August 17th
0900 Build your own project
1200 Lunch
1400 Presentation & Demonstration
1800 Closing Ceremony

EVENTS INFORMATION

Things to Bring

Umbrella

Camera

Water Bottle

Personal laptop

Fees

Toyhause does not charge any participation fees. All materials, transportation, meals and entrance fees involved for activities listed above are to be paid by participants.

STORYLINE //

Missionaries of this MEM Boot Camp Program constitutes of master students from across the nation, and from various industries. Within 4 days, they would visit 10 laboratories or institutes and investigate their research programs. Faculties and students from these labs or institutes will participate in developing the material and providing detailed information. MEM students are required to connect the practical experience and current issues in industries, together with technical or academic content in labs or institutes, and they must deliver this connection in the format of business proposals or plans. MEM students has already joined the program as early as 1 and a half month before the actual date as challengers, so that they would spend at least 2 weeks working with faculties and students from labs or institutes. Their task as challengers is to collaborate with research staff and present their content in a way that people from different background will understand after a glance. They must achieve in delivering professional guidance to other students and in enabling people both inside and outside the campus to utilize the academic resources for more practical uses. These achievements will be prepared in standardized digital publishing work flow and be delivered to the global digital world via Internet.

MASTER OF ENGINEERING MANAGEMENT ORIENTATION

SCHEDULE (PRELIMINARY)



August 27th

- 0900 Background & Mission Introduction
- 1000 Group Discussion
- 1100 Establish Industry Committee
- 1400 Visit to Fabrication Lab I
- 1500 Tools Introduction
- 1600 Determine Themes for Industry Chain
- 1700 Joint Publication

August 28th

- 0900 Technical Training I
- 1000 Intellectual Property Trading Rights Traning
- 1100 Visit to Fabrication Lab II
- 1400 Technical Training I
- 1500 Product Development I
- 1600 Inter-group Discussion
- 1700 Intra-group Discussion

August 29th

- 0900 Joint Report I
- 1000 Auction
- 1400 Product Development II

August 30th

- 0900 Document Preparation
- 1000 Media Preparation
- 1400 Joint Report
- 1600 Award Ceremony

STORYLINE

Participants are challenged to develop a low-cost LEGO® scanning probe microscope in a week. Throughout the program, participants get to experience first-hand on the latest technologies for 3D printing on the macro, micro and nano scales. These facilities are all available at the Center for Nano and Micro Mechanics at Tsinghua University and the Institute of Microelectronics at Peking University.

Scanning probe microscope utilizes ‘touch’ instead of light to image a sample. This avoids the wavelength dependent diffraction-limited resolution of optical systems. By moving a sample on a platform beneath an interacting tip, the surface of the sample can be mapped with angstrom resolution. The precision of scanned sample is dependent on the precise control of the sample’s position and the sharpness of the felt tip.

Participants will be given various tools and materials to develop the final product. The winning team will be invited to Denmark as support to further develop promising prototype.

CNMM Center for Nano and Micro Mechanics

THU Tsinghua University

LCN London Centre for Nanotechnology

UCL University College London

AFM Atomic Force Microscopy

NCNST National Center for Nanoscience and Technology

SCHEDULE (PRELIMINARY)

September 1st

1130 Introduction & Lunch

1300 Introduction on LEGO2NANO by Francois Grey, CNMM THU

1330 The Extreme Learning Process by Ben Koo, Toyhouse THU

1400 Open Wisdom Lab by Luping Xu, CNMM THU

1430 LEGO® and Learning, LEGO Learning Institute

1500 Tea Break & Team Formation

1530 Team Building Exercise

1800 Dinner

September 2nd

- 0900 Low-cost Nanotechnology by Gabriel Aeppli, LCN UCL
0930 Polymer-based Micro & Nano Fabrication by Yu Xiaomei,
Institute of Microelectronics, Peking University
1000 LEGO2NANO Day 1: Building the AFM Scanner
1900 Dinner

September 3rd

- 0900 Scanning Probe Microscopy by Neil Curson, LCN UCL
0930 3D Packaging for Microsystems, Institute of Microelectronics,
Peking University
1000 LEGO2NANO Day 2: Testing AFM Scanning & Data Collection
1700 Visit to Microelectronics Institute, Peking University
1900 Dinner

September 4th

- 0900 Trees & Nanotechnology by Quanshui Zheng, CNMM THU
0930 China & The Open Hardware Industry by Eric Pan, CEO of
SEEED Studio
1000 LEGO2NANO Day 3: Defining A Classroom Science Project
1700 Visit to NCNST, Chinese Academy of Science
1900 Dinner

September 5th

- 0900 The Maker Movement in China by David Li, Founder of
XinCheJian Makerspace, Shanghai
0930 The Maker Movement in the UK by Ellie Doney, Institute of
Making, UCL
1000 LEGO2NANO Day 4: Establishing a Project Website
1700 Visit to Beijing MaxPace Maker Community
1900 Dinner

September 6th

- 0900 Project Presentation & Demo Preparation
1500 Presentation
1800 Award Ceremony
1900 Dinner

September 7th

- 0900 Group Excursion to the Great Wall

NOTE

LEGBNAN 蘭華高到納米纖維鏡

活动行程（草案）

CNMN	清华大学微纳力学与多学科交叉创新研究中心	THU	清华大学
UCL	伦敦纳米科技园中心	LCN	伦敦大学学院
AFM	原子力显微镜	UCL	伦敦大学学院
NONST	国家纳米科学中心	THU	清华大学

纳米扫描显微镜研讨会是利用触摸而不是光线来读取样本。这可避免对干涉仪的行射极限的光学系统分辨率的依赖。样本将被安置在一个会移动的平台上，其表面将被纳米探针读取。扫描的精确度将会被样品位置控制器以及探针的精确度所影响。

清华由清华大学的微米和纳米研究所和北京大学微电子学研究所提供。这些设施都将是最新的三维打印技术。这些设施将由清华大学的微米和纳米研究所和北京大学微电子学实验室、微观和纳米级的最新三维打印机。这些设备都是为任务方必须用乐高积木在短短的一个星期内开发低成本的纳米扫描显微镜。在这期间，任务方得以体验第一手的纳米扫描显微镜。

任务方必须用乐高积木在短短的一个星期内开发低成本的纳米扫描显微镜。在这期间，任务方得以体验第一手的

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工程管理硕士新生導引

八月二十七日 活動行程（草案）

早上九時 請景介紹任務發布
下午十一時 產業委員會成立
下午二時 實驗室參觀 I
下午三時 工具基本介紹
下午四時 確定產業鏈主題
下午五時 聯合發布

早上九時 工具培訓 I
早上十時 知识产权及交易培訓
下午十一時 實驗室參觀 II
下午十二時 工具培訓 II
下午三時 技術開發 I
下午四時 組間交流
下午五時 組內交流

早上九時 聯合汇报 I
早上十時 執售
下午十一時 技術開發 II
下午十二時 組內開發
下午十三時 組間開發
下午十四時 組內開發
下午十五時 聯合發布

八月二十九日
早上九時 聯合汇报 I
早上十時 執售
下午十一時 技術開發 II
下午十二時 組內開發
下午十三時 組間開發
下午十四時 組內開發
下午十五時 聯合發布

八月三十日
早上九時 文档准备
早上十時 視頻准备
下午十一時 联合汇报 II
下午十二時 演讲獎勵
下午十四時 联合發布

此次MEM课程班中来自全国各地各个行业的学员将作为任务方，在4天时间内，对清华大学、北京交通大学和新加坡科技大学的十一个实验室的科研项目进行调研。这些实验室的研究生团队和访问学者会与XLP课题组设计团队组成本次活动的挑战方。参与课程的MEM学生将把实验室资源与产业实践经验及当前业界问题结合，识别社会中隐匿的商业机会，并撰写项目推广计划书。同时，挑战方会在活动前期1个半月到1个半月的时间内，整理相关学术内容，交流沟通了各实验室现有资源，制作包括视频、宣传材料在内的数字化出版物的工作模板。这些数字化宣传板会为任务方和实验室研究团队双方，在开拓市场的工作过程中，提供专业化的引导。本项目旨在训练清华师生更加有效地通过数字化的成果发表流程，了解清华各个实验室的现有资源，并且把清华大学的研究能量，经过此类教学工作的努力与资源整合，投送到全球化的数字国度中。

件。

Toyhouse对于设计活动项目本身不对参与者家庭收取任何费用但活
动过程中所涉及的工具，门票，交通及午餐费用需由参与者支
付。

活动费用

个人电脑	瓶装水
摄影机或相机	雨伞
必备品	

闭幕	下午六时
作品展览和演示	下午二时
午餐	中午十二时
作品设计和建造	早上九时

自由活动	下午六时
总结	下午五时半
游戏攻略设计	下午二时
午餐	中午十二时
设计课程	早上九时

自由活动	下午六时
总结	下午五时半
设计和技术工作坊	下午二时
午餐	中午十二时
参观掌上明珠游戏公司	早上九时

自由活动	下午六时
总结	下午五时半
植物识别	下午二时
午餐	中午十二时
参观北京西部凤凰岭	早上十时

自由活动	下午六时
总结和打印3D颐和园模型	下午二时

活动行程

八月十日，和我们一起将开始一段中国传统文化与现代
数字结合的美妙旅程！

根据学习国粹家匮乏，以中国传统文字化为视角带领孩子和家长发现古老中国数字的原始之美。国粹家匮乏项目目前五天，Toyhouse将通过丰富多元的活动使家庭不断了解中国传统文化与数字化概念，活动内容包括：了解大自然的五种元素以及五行相生相克的关系，利用传统医学反思并分析我们的生活和行为，在中国传统军事策略宝典下设计电脑游戏等。国粹家匮乏项目后三天，主办方会引导孩子们结合前五天所学并运用数字化的工具制作自己的数字化学习成果，真正实现学以致用。

我们生活在了一个数字化的国度之中，计算机和数据存在于社会的各个角落。



关于极限学习过程(XLP) 背景简介
极限学习过程，是一种基于分布式学习方式的工作流产生的学习
考核。XLP由清华大学环境系研究团队设计开发，是一
种融合了信息技术与实体校园的操作系统，体现了新型
的校园学习方式。

关于极限学习过程(XLP)



LONDON CENTRE FOR
NANO TECHNOLOGY

SINGAPORE UNIVERSITY OF
TECHNOLOGY AND DESIGN
Established in collaboration with NUS
UNIVERSITY OF OXFORD

London Imperial College

关于玩具坊 (TOYHOUSE)

玩具坊是由清华大学图书馆数据挖掘发起的非正式学习方法研究实验室和实践性组织，最早成立于2007年，现由清华大学工业训练中心。同时，玩具坊还与北京交通大学软件学院共建了长期技术合作关系。自创办以来，玩具坊在探索中取得了长期间技术合作成果。受到了清华大学、知识共享(Creative Commons)、美国阿拉斯加大学、哥伦比亚大学、新加坡(City University of Singapore)、高等教育出版社、乐高集团等院校机构的高度重视与大力支持。

玩具坊的主要成员来自清华大学工程系和基础部工业训练中心。同时，玩具坊还与北京交通大学软件学院共建了长期技术合作关系。自创办以来，玩具坊在探索中取得了长期间技术合作成果。受到了清华大学、知识共享(Creative Commons)、美国阿拉斯加大学、哥伦比亚大学、新加坡(City University of Singapore)、高等教育出版社、乐高集团等院校机构的高度重视与大力支持。

玩具坊，立足现代网络信息技术和计算机技术，通过对现代教育管理方法的应用，试图对传统教育模式进行反思、并实现对不同学习方式的应用、总结面向新时代的学习方法论。在这一理念下，玩具坊先是在清华大学的课堂上、并实现了“分布式学习工作流”的理论概念。在此基础上，提出了“极限学习过程”的学习活动模式，并多门课程中设计并组织了不同的学习和教学活动。在此综合总结了“分布式学习工作流”的理论概念。

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SUTD-MIT
INTERNATIONAL
DESIGN
CENTRE



toyhouse

Learn by Playing



ORGANIZERS:

二零一三年七月至九月

建設可持綫數字國度

INTERNATIONAL SUMMER PROGRAM

國際暑期項目



極限學習課程

