ARCHITECTURE AND SUSTAINABLE DESIGN
Dear PhD Applicants,

In medical circles, an old quote goes, "operation successful, but patient died." As an architectural school grounded in technology, there is always an inherent danger of forgetting the patient, while putting too much emphasis on the operation. The ASD PhD programme represents our focused attempt to overcome this danger and introduce a deeper, theoretical dimension into architecture and sustainable design.

Our particular geographic position in Singapore and our intimate collaboration with the other pillars at SUTD provide a unique platform for addressing some of the most pressing research problems in architecture and urbanism today. We offer a competitive edge in tackling research questions such as those related to the rapid urbanisation in Asia, the digitalisation of design practice, or the transformation of fabrication by algorithms and robotics.

At SUTD, we believe that great architecture schools do not just transmit existing knowledge. They foster an atmosphere for continuously reinventing and creating new knowledge involving faculty, students and practitioners. Teaching, research and practice thus go hand in hand, and complement each other. Teaching nurtures research, research innovates practice, and practice in turn inspires teaching. The PhD programme is an integral part of this triad, closing and lubricating the feedback loop. PhD students will benefit from active collaboration with the industry, from an international collaboration, and from a mentored teaching experience.

The ASD PhD programme epitomises our commitment to critically debate and advance the future of architectural and urban culture, practice and innovation, and we look forward to welcoming you to be part of it.
Course Overview
The ASD PhD at SUTD is a programme for highly creative and motivated individuals who wish to engage in intensive research and scholarship related to the built environment. The programme covers a broad range of subjects and represents the cutting edge of design investigation. Based on a multi-disciplinary approach, it covers areas such as architecture, design technology, urban design, urban planning, and environmental studies, providing rich opportunities for diverse approaches of investigation. The programme is composed of researchers and scholars whose areas of expertise and study are closely related to the various academic curricula offered at SUTD.

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<th>Coursework</th>
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<td>Four graduate level courses (12 credits each)</td>
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<td>One 2-term special research project (24 credits)</td>
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<td>Six PhD Pro-Seminars (12 credits each)</td>
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<th>Before end of 5th Term</th>
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<td>To pass General Examinations</td>
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<th>After General Examinations</th>
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<tr>
<td>PhD research</td>
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<td>Optional overseas attachment and internship (up to 6 months each)</td>
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<th>Before Year 5</th>
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<tr>
<td>Submit thesis and pass PhD oral defence</td>
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<tr>
<td>Meet minimum residency of 3 years and teaching training</td>
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<td>Complete other requirements</td>
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Careers
Our graduates can look forward to a range of prestigious positions in the architecture and building industry, and academia.
SUTD PhD Programme

**DiGiTAL HEriTAGE**

**ArCHiTECTurAl roBoTiCs**

Investigation on digital workflows for the documentation and conservation of heritage architecture using 3D scanning, modelling and printing technologies.

**ARCHITECTURAL ROBOTICS**

Investigation on advanced digital fabrication technologies for the design and construction of contemporary architecture.

**PICTURING CHINESE SPACE**

Through Chinese architectural representation, this research studies the socio-cultural influence on spatial concepts and how this has impacted the development of Chinese architecture.

**CREATIVE AGING CITY**

Linking ‘age-friendly city’ and ‘creative city’, this interdisciplinary research investigates socio-cultural appropriation of space in diverse local conditions in Asia to propose new frameworks for a ‘creative ageing city’.

**SOCIAL URBAN LAB**

This research addresses the underlying socio-cultural values as results of urban history, to propose collaborative ‘social design’ processes and to prototype meaningful places for sustainable development.

**STYLIANOS DRIPTAS**

ASSISTANT PROFESSOR

SMArchS, Massachusetts Institute of Technology

Research Interests: Design Computation.

**OLIVER HECKMANN**

ASSISTANT PROFESSOR

MArch, UCL, Bartlett School, London


**JEFFREY HUANG**

HEAD OF PILLAR AND PROFESSOR

PhD, Harvard University


**HOUSING TYPOLOGY RESEARCH**

“Floor Plan Manual Housing”, an internationally published book on housing typology, investigates more than 150 housing projects by means of a systematic analysis and typological perspective. It documents innovations in housing and places them in context of important examples in architecture history.

**ADAPTIVE REUSE, URBAN TRANSFORMATION**

The projects conducted in multi-disciplinary teams focus on the transformation and conversion of urban quarters and sites like former military tank training areas, with a particular interest for conceptual programming.

**ARTIFICIAL MORPHOGENESIS**

The project examines computational form-finding processes for architecture and urbanism, and the effect of algorithms and environmental data, such as wind, sun, water, soil, topography and climatic conditions, on design quality and sustainability.
BIONIC DESIGN
Bionic design utilizes the interdisciplinary science of nature in the course of the evolution of optimized natural constructs, such as insect wings, leaf structures or surfaces and its vast technical capacities.

GREEN BUILDING STOCK
The building stock has a high “green” significance, because it offers a huge potential for energy savings. The research project involves the development of a decision support for energy-saving measurements.

HYGROThERMAL PROCESSES IN HISTORIC BUILDING SKINS
Energy-saving measurements for heritage-protected building skins deal with the development of structure-friendly concepts to reduce the energy effort and hygrothermal relevant measurements.

INTEGRALLY BIPUCATED SHEET STRUCTURES - COLLABORATIVE RESEARCH CENTER 666
The interdisciplinary CRC 666 is engaged in the design of ribbon metal sheet shells. There are research subsistences such as Parametrically Generated Free-form Surfaces and the Deformability of Aesthetic Restrictions among others.

ARCH_CFD: COMPUTATIONAL FLUID DYNAMICS FOR ARCHITECTURE
A multi-disciplinary research initiative to find ways of utilizing CFD to support early stages of the architectural design.

TJ: TOPOLOGICALLY INTERLOCKING JOINERY
A multi-disciplinary research initiative to create new computational design methods to exploit TJ’s and design new concepts for joining architectural elements.

HIGH RESOLUTION SPACE: INTEGRATED LIGHT FIXTURE DESIGN
A multi-purpose research laboratory and gallery space using low power, heat emission, and cost LED elements housed in a bespoke-manufactured high-performance refractive lens enclosure.

Sawako KaJIMA
ASSISTANT PROFESSOR
M.Arch, Massachusetts Institute of Technology
Research Interests:

Stefan SchAEFFER
VISITING PROFESSOR
1st Diploma, University of Applied Science at Kaiserslautern
2nd Diploma, University of Stuttgart
Research Interests:

Thomas schroepFEr
ASSOCIATE PROFESSOR AND ASSOCIATE HEAD OF PILLAR
PhD, Harvard University
Research Interests:

Andres SeVtsuk
ASSISTANT PROFESSOR
PhD, Massachusetts Institute of Technology
Research Interests:

DHoBY BASE
The Singapore Institute of Architects award winning design and research project analyses daylight factors and structural displacements and uses computational simulations to define density requirements for the structure’s skin. A parametric model translates these requirements into an intricate geometric pattern of varying porosity.

SINGApORE nEW JURoNG CHURCh
The Singapore New Jurong Church is a contemporary high-rise church in a dense city surrounded by high-rise apartments. The research for the project employs state-of-the-art daylighting and energy-use simulations as well as parametric design strategies to analyse and inform building form as well as material choices.

URBan NETWORK ANALySIS TOOLBOX
The Urban Network Analysis Toolbox, developed at the City Form Lab, is used by researchers around the world to study pedestrian accessibility in dense urban areas.

SUTD GriDshell
The SUTD Gridshell, located on the Dover campus, demonstrates a full-scale prototype of making flexible and affordable gridshells out of flat material using simple cutting technology.

URBan FORM IN BugIS AND PUnGGoil, sG
The City Form Lab is studying walkability and activity patterns in the Bugis and Punggol districts in Singapore, using detailed data surveyed on the ground.

ENTRePREneURSHIP PATTErNS IN sLoLo
We are studying the location patterns of small commercial enterprises and in Solo, Indonesia in order to understand how jobs created by small entrepreneurs can positively impact the economic development of a city.
This research surveys and attempts to understand the interactions of Sino-Southeast Asian spatial concepts, as well as the material culture of heritage structures in the region. It is organised under several interrelated themes including Heritage Buildings and Digital Tectonic, Crafts of Conservation, Historic Architecture Iconography, and Documentation. This will take the form of historical, typological and iconographic studies, focusing on the understanding of architectural material culture.

SINO-SOUTHEAST ASIAN SPATIAL CONCEPTS AND CONSTRUCTS

YEOKHANG SHUA
ASSISTANT PROFESSOR
PhD, National University of Singapore
Research Interests:

BUILDING ENVIRONMENT MODELLING (BEM)

This research aims to assess and increase the livability of high-rise high-density public housing environments. A BEM approach is developed that combines BIM, GIS, and information modelling (ArcMap) in order to create an integrated design environment that supports informed design decisions. Data visualisations from various crowdsourcing applications and contextual resources such as behavior and flow of people are integrated in BEM, leading to analyses and simulations.

BEGE TUNCER
ASSOCIATE PROFESSOR
PhD, Delft University of Technology
Research Interests:
Information Architecture, Building Information Modelling and Design Learning Environments.

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Applications

• Submit your online application at https://admissions.sutd.edu.sg/phd
• Shortlisted applicants may be asked for Skype/telephone interviews or, in some cases, face-to-face interviews may be arranged.

For enquiries relating to application, admissions and scholarship matters, please write to phd@sutd.edu.sg.

SUTD President’s Graduate Fellowship

This bond-free fellowship (up to 5 years) is open to all nationalities, and is awarded on a competitive basis to outstanding full-time PhD Programme applicants (e.g. those with a Bachelor’s Degree 1st Class Honours or equivalent). The fellowship supports:
• Full tuition fees
• Monthly stipend of $5,000 for each awardee and up to 10% additional stipend for Singapore Citizens and Permanent Residents
• Annual conference funding
• Opportunities for overseas research attachments and/or industry internships

Contact Us

Website: http://asd.sutd.edu.sg/
Email: phd@asd.sutd.edu.sg
This research project carried out by Professor Stylianos Dritsas and Professor Yeo Kang Shua looks at the creative interplay between natural and artificial media, the emergence of a hybrid tectonic grain at the intersection of traditional analog form, material and craft, and contemporary digital information acquisition, processing and fabrication.