Programme

FARU 2019

12TH INTERNATIONAL RESEARCH CONFERENCE

Re-evaluating Space

Across Disciplines

FACULTY OF ARCHITECTURE
RESEARCH UNIT
UNIVERSITY OF MORATUWA, SRI LANKA

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3rd December 2019, Institute of Technology University of Moratuwa,
Diyagama, Homagama, Sri Lanka

PROGRAMME

8.00am	Registrations
8.30am	Arrival of Guests
	Inauguration Ceremony – Venue A, 9.00am
9.00am	Lighting of the Traditional oil lamp and Opening act
9.10am	National Anthem
9.20am	**Welcome address by Prof. Lalith De Silva**
	Dean, Faculty of Architecture, University of Moratuwa
9.30am	FARU 2019 Theme Video
	Theme Address by Dr. Sumanthri Samarawickrama
	Director, FARU - Faculty of Architecture, Research Unit
	Play of FARU 2019 - Theme animation
9.35am	**Address by the Chief Guest, Prof. K. Kapila Perera**
	Vice Chancellor, University of Moratuwa
9.43am	**Introduction of the Keynote Speaker by Dr. Upendra Rajapaksha**
9.45am	**Conference Keynote by Prof. Jürgen Reichardt**
	Professor at the Münster University of Applied Sciences,
	MSA -Münster School of Architecture, Department of Building
	Construction, Industrial Construction, Germany
10.30am	End of the Inauguration ceremony
	Scientific Session – Venue A, B, C, D, 10.45am
10.45am	**Session 01 –** Three parallel Sessions
12.30pm	Lunch **–** ITUM Staff Lodge
01.30pm	**Session 02 –** Three parallel Sessions + Research Experience
03.00pm	Tea break
03.30pm	**Session 03 –** three parallel Sessions
05.00pm	Poster Presentation Session
	Summing up and Award Presentation – Venue A, 6.00pm
6.00pm	Introduction to the Student Demo Presentation
6.05pm	The student Demo presentation (interactive session open for questions and answers)
6.30pm	Awarding of Certificates
	1.Student Demo Presentation
	2.Best Poster award
	a.Bronze b.Silver c.Gold
	3. Best Paper award
	a.Theme **–** Re-evaluating Space across disciplines
	b.Theme - Usage of space and human interaction
	c.Theme - Professional space and economic impact
	d.Theme - Experiencing space and perception
	e.Theme - Spaces in history and new learnings
	f.Theme - Physical and virtual space as concepts
	4. Best Overall Paper award
	5. Outstanding contributor of FARU 2019 award
6.45pm	Vote of Thanks
	Conference Dinner – ITUM Staff Lodge, 7.00pm

FARU 2019

Keynote Address

Re-Evaluating Climate Responsive Architecture

Professor Jürgen Reichardt

I would like to begin this talk with a small story.

I was in Ankara, Turkey back in 2000 curating an exhibition of German Architecture at the Goethe Institute. "Volume, envelope and climate" was the focus for presentations by a group of then contemporary German and Turkish Architects. An enthusiastic young Turkish Architect proudly presented an office project located somewhere near the Turkish Riviera, where it is very hot and sunny. The project appeared to be quite like the widely published Cartier building at Paris designed by Architect Jean Nouvel. I finally mustered a bit of courage and asked if such a glass palace project would be appropriate considering the extreme climatic conditions of the Turkish site. The said architect initially acted naïve but on being questioned further become hostile as doubts were being raised on his seemingly unquestionable artistic expression.

Now after almost 20 years difference, looking back it appears that not much has changed across the world with reference to 'our' collective conscience towards climate responsive architecture.

What are the forces which drive climatic architecture and where can we find suggestions? From my point of view, historical examples of 'volume', 'envelope' and 'climate' might still show us the way forward. I would then like to explain a simple methodology with which we work in our office and would become the basis for student seminars and projects at the MSA Muenster. Finally, I have the pleasure to propose aims and a broad roadmap for the two-year German Government funded DAAD ISAP cooperation project with Faculty of Architecture of Moratuwa University, Colombo.

The first architect we want to look for in our pursuit for "volume" is Albert Kahn, an immigrant from a small village of Hunsrück in Germany. His father was a Jewish wandering preacher who immigrated with the eight-member family to Detroit, U.S. in 1880. With no formal academic background, poor but talented Albert was lucky to be recognized by Packard Automotive Company and Henry Ford. From 1905 onwards, Albert Kahn was commissioned for the construction of huge factories which went on to become definitive role models for the Bauhaus Movement in Germany. In his lifetime he built more than 2,000 industrial buildings, including more than 500 factories in the Russia. The Packard Forge, a 1910 building for welding of automobile parts, looks like a Gothic Cathedral in iron. The basilica type floor plan with a suspended gantry crane and a step-shaped fully glazed sections were chosen to permit maximum natural light as possible into the workplaces. Moreover the hot swaths could thermally drift upwards during welding. From our point of view one of the very first brilliant examples for "form follows performance" approach in architecture. Another stunning building of his is the Ford Glass Plant in River Rouge 1922. Henry Ford was producing Model T car in millions of units at that time, making everything himself in his works, including 2 million square meters of glass for windshields. This glass was melted under the "ears" at the front of the building, hot exhausts were sucked out through smart profiling of the section of the huge building, similar to the Forge Shop.

We are delighted to have recently chronicled his brilliant designs in a book titled "Albert Kahn, Form Follows Performance", Excerpts of the said book is currently on display in an exhibition at Faculty of Architecture of Moratuwa University.

The second position applies to aspects of building envelope and aerodynamics with Buckminster Fuller. Professionally a naval officer, Fuller designed and built the "Dymaxion Car" in the early 1930s, the drop-shaped device for 8 people ran at a top speed of 180km/ h in its time, a three wheeler with an awesome CW value of 0.27, similar to a futuristic airplane with a metal sheeted shell. At a time when the subject of wind was not even on the screen of the developers, Fuller had a clear understanding of aerodynamics, leading in 1946 to the Dymaxion House project, a saucer like shell following manufacturing ideas of aircraft industry. The house was raised high off the ground, thereby introducing relatively cold air through the floor. This air flowed through the house as spring air and escaped again through an upper "fin". It was indeed a very smart way to passively ventilate a house by means of aerodynamics and meteorology, without stuffing it with mechanical A.C.

The third example clearly deals with the topical climate. The building is not very well known in the Western world. It is located in Pondicherry, near Chennai (formerly Madras), India. The Golconde House was planned and built around 1935, as a guest house nearby the ashram of Indian philosopher Sri Aurobindo. There was a contact to Tokyo based Architects Anthonin Raymond and George Nakashima, former employees of F.L. Wright for 1922 Imperial Hotel Tokyo. The envelope of this highly remarkable structure is made of movable louvers, deliberately orientated towards the sea breeze, away from the extremely harsh eastern and western sun. Also interesting are the aspects of sustainability, where the complete house was built with locally sourced materials by the disciples of the “ashram workshop”. Incidentally, it was the first exposed concrete construction site in India, that Architect Charles Correa says, ‘was the beginning of Indian modernism…’. The building is still functional today, even after 80 years, probably one of the coolest places in Pondicherry.

In the second part we ask ourselves, how can we re-evaluate these examples for the present, and especially for our future amid dramatic global climate change? We strongly believe that architecture must work holistically and intrinsically with the regional parameters of volume, envelope and climate. In analogy to the DNA of living entities, one could understand the design parameters as the genetic code of the building’s specific performance requirements, hence its “Building DNA.” In a nutshell, architecture must provide comprehensive "performance" against measurable parameters.

We have therefore subdivided this performance approach into sub-projects, which we try to optimize from programming till the finished project, all together these sub-projects cling together in a network to synergies of a holistic “Form Follows Performance “project.

First sub-project topic deals with analyzing specific Geographic situation. As you are aware, it makes a huge difference in building in the arctic circle, where it is consistently cold throughout the year, requiring only insulation when compared to designing and detailing in the temperate zone, where we live in Central Europe. This is quite challenging, because in the winter one might experience temperatures upto minus 10 degrees Celsius and in the summer upto 40 degrees nowadays, making a difference of 50 degrees. It is complicated to detail and specify building systems, technologies and materials; a cozy insulated building in winter would trap internal heat gained in summer making it unlivable. Similarly, dry, dry hot and humid warm environments need to be treated very differently. One can cool a building in the dry hot zone at night, because it is pleasantly cold in the desert climate at night, open the windows and the building cools down. This strategy cannot be used in the subtropics, where the nights are warm as well as extremely humid. So, one must deliberately analyze in which climate zone the building is being designed and built. It would be appropriate to follow the local building tradition of the zones under discussion. In the subtropics, for example, large thermal storages would be counterproductive. The building components would attract fungal growth due to the existence of hot and humid conditions.

The aspect of Topography is another sub-project. Location, windward versus leeward side, azimuth as well as altitude, temperature, air pressure, rainfall, precipitation and humidity, others all add up towards a comprehensive understanding of the site topography.

The raised houses of Indonesia were a result of understanding and use of thermal drafts, which pulls the hot air through the tops of the roof, and thereby generate a natural passive cooling. In Turkish Cappadocia and southern France cave dwellings were advantageous for a hot climate, because stone walls proved to be pleasantly cool. As is Mesaverde in U.S., the flat warm winter sun is caught to warm up the pueblos, but not the high, hot summer sun. For the building it is a truism that we must build compactly in Central Europe, e.g. in Envelope / Volume ratio, Lots of Volume, little envelope surface avoids the loss of heat in winter season. That would be favorable in Central Europe, but this strategy is not transferable to other climates and may look quite different even in Europe when the climate changes. Emperor Penguins of the Antarctic Circle are well suited to their environment, their large volumes lose less heat.

Zoning is a next aspect. In the simple example of the Black Forest farmhouse, where the cow in the center of the volume warms up the inhabitants in winter, and the cut straw around is the insulation. In the summer cattle and straw are in the fields, resulting free air spaces cool the house. It is therefore about understanding which zones of use require which temperature and how are these then arranged in plan and section. Another example of energy optimization, for the climate of Central Europe, is the passive house. We have analyzed the same in projects of passive house research. Different structures, which have a relatively similar footprint, have relatively similar volume. Due to the rotation of the building in the virtual climatic space it is obvious, for example, how the sun travels over a specific location and the consequent energy patterns across the year. Lounge to the south, with use of the flat winter sun, adjoining rooms to the north.
This strategy would not be very clever in India, problems would certainly arise. Incidentally the essence of VASTU and FENG-SHUI dating back five thousand years is still relevant in India and in China respectively. Rooms were carefully zoned, e.g. never put a kitchen and storerooms to west, because bread and rice will be spoiled.

The Envelope would be the next aspect to be examined, certainly a very difficult one, also from the dynamic development of building materials technology. We need sunscreens, we must balance energy, we also must be versatile, optimize cleaning and maintenance, then consider the various aspects of aesthetics. It's really a huge topic, and I think that perhaps not everything industry promises us should be believed.

For example, a combination of naive architects and hungry glass industry led in Central Europe to the propaganda for double façades, which were marketed as highly sustainable. After 20 years and manifold experiences we are now much more critical towards twice amount of façade construction material and summer heat accumulation within the glass layers.

Sustainability comes as the next parameter, a comprehensive life cycle assessment is very complex, because the lobbies of any building materials claim that their materials are extremely environment friendly and favorable for recycling. Of course, this is interwoven by aspects of Lifecycle, so to say total expenditures over the useful life of a project. From our point of view, perhaps the visualization of “Construction Kits" brings us a bit further here. Visualizations show examples of explosive sets of construction systems, conveying a better awareness of production, logistics and (re) assembling steps, BIM approach here might attach multiple text data to 3D objects as: Totality of energies involved? Consistency of Materials? Weight of Materials? Transport Ways? Ability of parts to be recycled or rebuilt? As a result CO2 pollution footprint services should be minimized.

We would prefer to build sailboats in architecture and not motorboats. Contrary to needs for mechanical techniques, passive Natural Ventilation should be aimed at.
Good examples for sailing strategies in traditional architecture might be looked at Rudowskys book "Architecture without Architects”. Essentially it is about understanding how thermals work, or more scientifically, about balancing of negative pressures and overpressures. Rudowsky includes the wind towers of Hyderabad. In a dry, hot climate, with cold nights, winds are captured with special, wind-facing surfaces, steer them into the house and water bodies, hence cooling spaces passively.

At the end of the day probably the most important aspect is Ecology, networking our projects with the flora and fauna of nature. It is for an example not understandable as to why we continue to build black cardboard roofs, whilst extensive roof greening just in the city could help to reduce Urban Heat Island Effect. It would be good for the microclimate and for all living beings. Thus, being able to and open for networking with nature is major task in future. Unfortunately, an architect`s beautiful concept sketches are often too optimistic with intuitively created darts for “air in and out”; in reality air and thermal flows rarely behave accordingly. Of course, engineering’s now may be done better then purely sketched by hand (as with Kahn and Packard Forge Shop) based upon state- of-the-art 3D simulations of thermals and flow from the 3D models, on basis of weather data of specific site. I believe that we are part of a development that goes further and further towards BIM (Building Information Modeling) that we as architects are capable of a comprehensive engineering, analyzing formal decisions for an example in daylight capacities and energy balancing as general qualities of architecture. It is possible that this regionally influenced sensitiveness was lost through the uniformity of the International Style.

Now I introduce shortly three RMA office projects and three MSA Muenster student projects. First is my own Studio in Essen, Germany. The design uses the north backbone slope as a thermal mass to support the house in winter and summer. In the light weight hybrid steel house climate-buffering storage masses are provided by concrete slabs and a central brick core. the “construction kit” illustrates a complex hybrid system of different building materials. The mixture of concrete walls and slabs, steel construction, inner cement block core, shell in redwood sidings and glass. Solar thermal and water storage for gray water are also part of the project. We also learned that nature does not always behave as we assumed. In our thermal simulation, the tree they see in front of the picture was planned. He was part of the simulation an existing huge tree was responsible for shading the large glass surfaces on the Westside. He was sick at some point over the years and then had to be cut down. As natural sunscreen was thus no longer available, shadow structure had to be retrofitted, tailored from old sails of fishing catamarans cruising at Negombo coastal line.

The second RMA project is Peter Solar Bakery in Essen, Germany. The building materials and technical systems used were selected from the perspective of holistic material cycles and holistically optimized in the 3D BIM model. The total of 2200 m² large roof areas of phase 1 and 2 will be completely equipped with photovoltaic collectors in the final construction. On the approx. 1100 m² large roof area of Phase 2, 123.000 kWh of solar energy will be used directly in the baking process of the rolls as well as in the refueling of the emission-free delivery van fleet for the sales branches introduces. With the delivery of the sales branches in the city area, approx. 36,000 liters of diesel fuel, equivalent to approx. 100 tons CO2 / year, are saved with a total mileage of approx. 300.000 km / year. The integral planning for layout and logistics, building and building services was monitored over the entire project period by a certification according to DGNB (German Sustainable Building Council). Within the framework of the competition "Energy-Efficient Building " of the Federal Ministry of Economics and Technology BMWI, the submitted projects were analyzed and evaluated according to their energy consumption in KWh / m²a. The project was awarded the City of Essen Environmental Prize, German Government BMWI award as well as international attention

The third project RMA is a High Bay Chocolate Storage in Aachen, Germany, amidst an existing complex industrial plant. Client asked for a 100 x 40 x 40 m automatic warehouse, as shelved space continuum, with a 36 x 36 m three story multifunctional volume for mainly shipping the goods. Special requirements were fire protection and thermal comfort of warehouse. As chocolate goods are very temperature as well as humidity sensitive, task was to engineer most economically strictly limited temperature span between 18 and 23 degrees Celsius in the warehouse structure. Logistics, architectural design and engineering of utilities were based on complete 3D BIM approach with Revit construction, with thermal and CFD simulations of interior of warehouse structure. Thermal modeling had to comprehend a multitude of different weather as well as logistical situations, e.g. temperature of stored goods out of producing plant, degree of loading, climatically winter and summer embedding. The fairly complex simulation calculation modeling finally comprised 8 million nods. In accordance of simulation results all utility equipment was detail planned and built. The future real life of temperature inside the warehouse will be monitored.

Then on basis of a series of student seminars I show shortly three student projects at MSA Muenster exploring CFD simulations out of BIM design and construction modeling's.
First project is an inner-city proposal for an urban apartment building refill in Medlin, Columbia. MSA student Sandra Aguirre explored thermal comforts in a three side closed dense building block on basis of specific weather conditions and different floor and section zoning as well as a variety of atrium strategies. Out of four options finally aroused the optimized design.

Another project dealt with a workshop for Bamboo constructions in Byanas, Philipinnes. Whilst visiting MSA in spring this year, Nethmi Jayaratne nicely fed in her Moratuwa ecology expertise into an international student design group. The shown project proposes the idea of an "upside down" wooden ship for volume of the workshop production area, thermal comfort of working environment was proven by means of CFD simulation. The third project is MSA student Anna Okon proposal for a new low cost new rural village in Mexico, with a system of simple building techniques, constructed by the inhabitants themselves. Out of modularity of an atrium twin house cell and infrastructure system layout was developed a communicative urban scheme, with ability for dynamic growth. CFD simulation was used to analyze the indoor and outdoor natural ventilation thermal comforts of the twin house cell. Finally in the third and last part of my contribution to FARU 2019 it is indeed my pleasure to broadly sketch the academic roadmap for German government funded two year DAAD ISAP cooperation project "Climate Responsive Architecture" between Moratuwa University, Department of Architecture, and MSA Muenster School of Architecture, Germany. Following DAAD 2005 to 2008 Triloka cooperation project, MSA Muenster was glad to initiate and invite a series of privately funded academic projects for selected students of Moratuwa for 2-month periods between 2016 – 2018.

Based on knowledge gathered so far, one noticed further possibilities in "Form Follows Performance" 3D BIM architectural engineering and simulation techniques, embedding in Muenster and Colombo parameters; it was broadly agreed that this academic basis should be thoroughly investigated and transferred to respective Universities for a WIN – WIN scenario for ALL.

It is needless to mention that MSA Muenster has extensive theoretical knowledge as well as practical experience in 3D BIM construction, e.g. prefabrication techniques in concrete, steel, wood, sustainability scorings of dynamic 3D simulation, passive housing, natural and artificial lighting, energy, ventilation. We are delighted to note that the University of Moratuwa is equally adept both in theory as well as practice, having a clear focus on South Asian Tropical Building Parameters e.g. ecology, nature and research in low energy systems and technologies.

We strongly believe that intense collaborative research will help synergizing the individual strengths aiming at a "finite" roadmap, improving existing digital tools, definition of requirements and fulfillment routings of "project milestones.

Further, it is believed that academic possibilities will arise due to now decided PhD classes in Muenster, allowing for even deeper involvement and outstanding expertise in integral planning techniques for Muenster MA/ PHD students as well as Moratuwa future Master students.

Special focus of the current two-year DAAD PPP student academic project is research on architectural support on ways out of global warming issue. Thus, on basis of state of the art and fast forward integral planning BIM techniques, as well as dynamic simulations of energy, daylight and ventilation, architectural engineering "quality assuring milestones" will be developed in close cooperation with tropical climate expertise in these fields at University of Moratuwa, Colombo.

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Session 02 – Track 04 – Venue A

Space and Human Interaction

Session Chair
Prof. Rangajeewa Rathnayake

1.30pm – 3.00pm

Impact of Natural Spaces on Mental Health and Satisfaction in Work Environments; Referenced to The Service Providers in Selected Health Care Institutions of Sri Lanka
Bandara. D.U. & Hettiarachchi A.A.
(pg 33)

The Impact of Learning Spaces on Creativity: A User Perspective Analysis with Reference to Studio Space Design
Pramod S. & Pathiraja M.
(pg 41)

Utilization of the Space in Between a Garment and the Wearer: A Discussion on the Garment Fit Usage of Space and Human Interaction
Beminiwaththa D.M.L.C. & Senanayaka R.J.
(pg 57)

Exploring Gender Differences in Students' Satisfaction with Hostels in Higher Education Institution Campuses in India Are We Designing Considering Students Could Be Girls?
Akshya Singhvi & Neeraj Gupta (pg 274)

Effect of Emotional Factors to Product Functionality on Hot Beverage Containers
W. Deshaja Dewapriya Kulathunga & W. M. N. Dilshani Ranasinghe
(pg 255)

Session 02 – Track 05 – Venue B

Physical and Virtual Space

Session Chair
Dr. Wajishani Gamage

1.30pm – 3.00pm

Understanding the Challenge of Digitally Twinning the Geometry of Existing Rail Infrastructure
Ariyachandra. M.R.M.F & Brilakis. I (pg 25)

Cooling Effect of Roadside Urban Shade Trees an Analysis on Urban Fabric of Dhaka
Mouly A.R. & Trina N.A. (pg 173)

Review of Suitable Parameters and Methodologies to Delineate the Traffic Impact area from a Proposed Development in Sri Lankan Context
Pathiraja A.L.A.C., De Silva P.C.P. & Jayasinghe A.B.(pg 202)

Mental Mapping of Diversified Urban Interaction Spaces at Residential Areas in Dhaka
N. Islam, S. Afroz & F.F. Haque
(pg 210)

Comparative study of impacts on design thinking by using AutoCAD and manual drafting in the schematic design stage
Hettithanthri A. & Munasinghe. H.
(pg 218)

City Form as a Strategy for City Branding: A Comparative Study of Kandy and Galle
Sandamini. R.G.P. & Herath. H.M.K.D.
(pg 158)

Session 02 – Track 06 – Venue C

Space and Economic Impact

Session Chair
Dr. Rizvi Noordeen

1.30pm – 3.00pm

Impact of Space Management to Core Business of Sri Lankan Higher Education Sector:Facilities Management Perspective
Jayasena H.A.E.C., Anushanga B.A.H. & Gowsiga M. (pg 70)

An Empirical Investigation on Factors Influencing to Consumers' Purchasing Decision Towards the Luxury Apartments in Colombo and Suburbs, Sri Lanka
Madushani K. H. A. & Piyadasa R. U. K.
(pg 125)

Hidden Costs of Mobility in Urban Areas
Mourya Amitesh Vijay & Vats Shivangi
(pg 168)

Re-Evaluating Spaces with Additive Transformations on Existing Resettlement Dwelling units
Punsisi P.K.A (pg 247)

Re-Evaluating Public Space in Urban Slum: A Case of Korail Basti
Noshin Siara Promy & Hasan Muntasir
(pg 377)

Transition from Urban Voids to Urban Realm: Utilizing Abandoned Spaces Beneath the Flyovers in Dhaka City
Shauni Priyam Sikder & Fahim Alam
(pg 394)

Session 02 – Track 07 – Venue D

Research Experience

Session Facilitator
Dr. Menaha Thyaparan

The Head Table :
Prof. Yasangika Sandanayake
Dr.Thanuja Ramachandra
Dr. Shalini Cooray

1.30pm – 3.00pm

This is an open session to discuss queries related to research such as:

- What it is to be a Post Graduate student at the Faculty of Architecture?
- How do we start the journey?
- What are the common issues we face in conducting Research?
- What are the procedures to conduct research?
- What is an index publication?
- Why is peer review publications important?

*You may drop your questions at the box at the Information Desk - outside venue A,B,D

*You are eligible to be part of this session by pre-registering at the information desk

Session 01 – Track 01 – Venue A

Construction Technology

Session Chair
Prof. Yasangika Sandanayake

10.45am – 12.30am

Investigating the Impact of Non-Load Bearing (NLB) Walls on the Built-up area and Dead Load in Multi-Storeyed Residential Buildings
Rastogi Abhijit & Paul Virendra Kumar
(pg 63)

A Study on Most Abundantly Utilized Timber for Structural Application in Sri Lanka
Sudeshika D.M.P., Mendis M. S. & Halwatura R. U. (pg 107)

Identification of the Possibility to Reuse the Ceramics Glazed Tile Waste as a Eco Friendly Raw Material for the Manufacturing Industry in Sri Lanka
S.U. Liyanage. & Dilshani Ranasinghe
(pg 150)

Integrating Enterprise Resource Planning System with Lean Concept to Minimise Waste in Sri Lankan Construction Industry – A Theoretical Review
Rasanjali W A., Disaratna V. & Withanage K.T.
(pg 190)

Development of Clay Material as an Ancient Inspiration for Cooling Enclosed Space for Contemporary Sri Lanka
Liyanarathne B.L.S.W. & Dilshani Ranasinghe
(pg 239)

Constructional Detail vs. Autonomous Detail: Evaluating the Notion of Architectural Detail with Respect to Spatial Construction
Sajith S. & Pathiraja M.
(pg 331)

Session 01 – Track 02 – Venue B

Space in History and New Learnings

Session Chair
Prof. Indrika Rajapaksha

10.45am – 12.30am

A Study of Iconic Female Sleeve Structures During the Colonial Period of Sri Lanka.
Bandara. A.M.H.N (pg 79)

Archiving 'Nagar Kashba' A study on the present condition and the architectural features of an evanescing historic settlement
Ferdousi Nabila, Gaurab Anindya & Adnan Enam Rabbi (pg 134)

Impact of Visual Landscape Characteristics of Urban Waterscapes on the City Image: A study of Sri Jayawardenepura Kotte
Ranatunga M.K. & Herath H.M.K.D.
(pg 223)

Sequential Experience of Spaces through Multi-Sensory Approach in Design: A Case Study of an Indian Temple
Fathima Rishin Razak & Sameer I.K. (pg 231)

Hierarchical Identity and Space; A Study on Long Surviving Railway Station Interior in Sri Lanka.
Samarasinghe.A.M & Jayasinghe.S (pg 307)

Personality Traits of Sinhala Fonts on Road Informative Sign Boards: on Readers' Preferences Test
Shyanika Eramudugolla & S.Samarawickrama
(pg 429)

Session 01 – Track 03 – Venue C

Space and Perception

Session Chair
Dr.Thanuja Ramachandra

10.45am – 12.30am

Impact of Colour on Worker Productivity and Satisfaction in the Garment Industry; A Case Study Implemented in Awissawella, Sri Lanka
Gunathilaka. D.M.L.R. & Hettiarachchi. A.A
(pg 18)

The Ethereal Partition Democratic Streetscape Potentials of Jashore Road Towards Equitable Benapole
J.F. Sonia, S.M.M. Abedin & S.N. Anjum (pg 49)

Relationship Between City, Campus Design and Social Interaction in Campuses of Higher Education: A Case of German Universities
Mittal Yash Kumar & Mittal Sobhagya (pg 90)

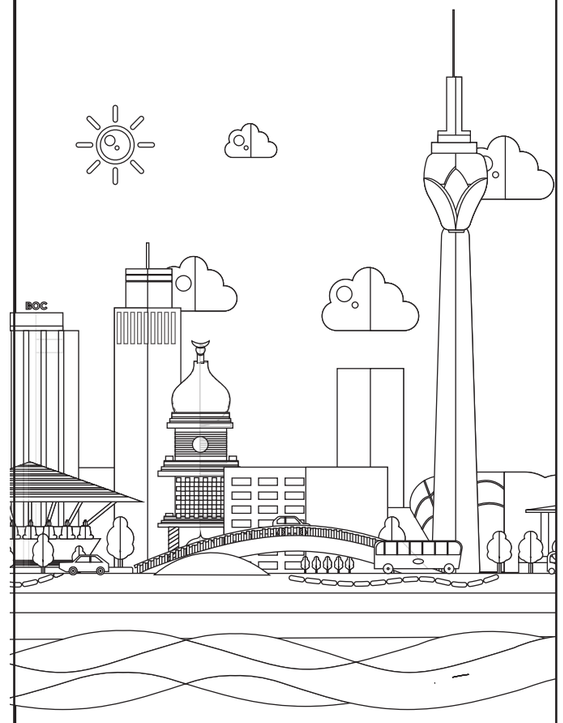
Influence of Neighborhood Street Pattern Focusing Dead-End Streets as Social Cohesion of Neighborhood: Delineating Physical Attributes of Dead-End Streets in Mohammadpur, Dhaka.
Afroz. S. & Talukder. R (pg 142)

Analytical Study of the Spatial Diversity in Additive Modular Architecture; With Special Reference to Dutch Structuralism
M.B.M.C.B.Gawarammana & W.P.S.Botejue
(pg 366)

Multifaceted Dimensions of Urban Form to Revitalizing Human Interaction in Dense Cities
Md Raihan Khan & Sadia Afrin Tisa (pg 385)

12.30pm - 01.30pm

Lunch will be served at the ITUM Staff Lodge



Session 03 – Track 08 – Venue A

Re-evaluating Sustainability

Session Chair
Dr. Jagath Munasignhe

3.30pm – 5.00pm

The Grand Canal Envisioning Water Urbanism as the Basis of Metropolitan Resilience of Dhaka City
Datta S. & Ahmed S.
(pg 420)

Biogas as a Sustainable Energy Management and Solid Waste Management Solution for Residential Apartments
E.R.G.E.M. Dhanapala, K.G.A.S. Waidyasekara & K.L.A.K.T. Liyanage
(pg 316)

Enhancing the Practices of Spare Part Management in Manufacturing Industry
Abeyratna S.M.D.N, Thayaparan M. & Fayasa A.F. C. (pg 324)

Appraising the Influence of Paving Materials on Pedestrian Thermal Stress in Tropics: Evaluating the effects of tree shading on surface thermal performance.
I. Rajapaksha & M. Ekanayake
(pg 290)

Examination on Methods, Techniques in Structural Designs of Green Wall Concepts: Application to Concrete Brick Wall in Sri Lanka.
Rahuman A.A. & Dilshani Ranasinghe W. M. N.
(pg 265)

Session 03 – Track 09 – Venue B

Disaster Management

Session Chair
Dr. Upendra Rajapaksha

3.30pm – 5.00pm

Enhance the Disaster Management Process through Social Media
Shandraseharan A., Kulatunga U. & Rathnasiri P. (pg 98)

Minimizing Problems in Conventional LPG Cylinder Manifolds used in Apartment Buildings in Sri Lanka
Jayantha Basnayake & Nayanthara De Silva
(pg 115)

Impacts of Culture to the Post Disaster Reconstruction Projects in Sri Lanka: Research Methodological Perspective
U. Kulatunga, Aparna Samaraweera, S. Vidana Gamage & R.S.S. DISARA
(pg 182)

Establishing Risk Indicators Impacting the Functionality of Critical Infrastructure in Extreme Weather Events
Niyati Gupta & Virendra Kumar Paul
(pg 299)

Use of Architecture in Demonstrating Political Power in Post-Confict Colombo
Katugaha. B.H.M.R.I. & Botejue. W.P.S.
(pg 282)

Session 03 – Track 10 – Venue C

Space in History and New Learnings

Session Chair
Prof. Samitha Manawadu

3.30pm – 5.00pm

Colour and Visual Perception: Exploiting Visual Perception of Colour, in Traditional 'Laksha' Products in Sri Lanka.
Dinuka Amarakoon. A.M. & Dilshani Ranasinghe. W.M.N. (pg 341)

Mutualistic Architecture: Implication on Wildlife Spatial Habitat in Tourism Related Buildings in Sigiriya, Dambulla Area
B.K.S.N. Goonawardena & S. Udalamatta
(pg 350)

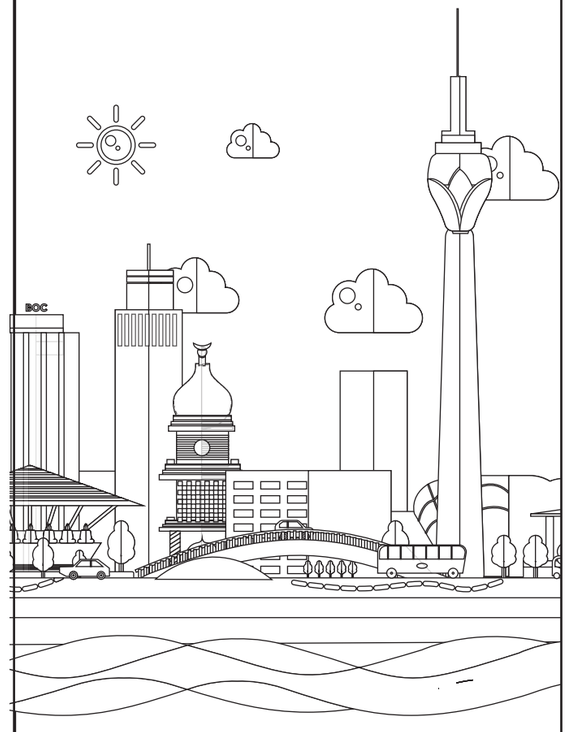
Releasing the Barriers of over Sanctification of a Sacred Space Re-evaluating functional configuration and usage of mosques in Dhaka, Bangladesh.
Hasan Muntasir & Noshin Siara Promy
(pg 358)

History as a Learning Condenser to Improve QOL (Quality of Life)
Sadia Afrin Tisa & Md Raihan Khan
(pg 404)

Sinhala Fonts and Dyslexia Adopting Latin Script Based Research in to Sinhala Reading Materials.
Malindi Jayathunga & S. Samarawickrama
(pg 412)

05.00pm - 06.00pm

Poster Presentation outside Venue B, D



Session 04

Poster Presentation

05.00pm – 06.00pm

Managing Municipal Solid Waste (MSW) Through a Cultural Perspective in Sri Lanka
Mendis A.P.K.D. & Thayaparan M.

Experimental investigation of Wearable Textile Sculptures to Control the Personal Space
Jayarathne J.U.S, Wickramasingha D.P.U.M

Synchronisation of Physical and Virtual Space: Geometric Digital Twinning of Catenary Masts in Existing Rail Infrastructure
Ariyachandra M.R.M.F & Brilakis. I.

An Amalgamation of Heritage, Culture and Contemporary Lifestyle 'Shuren Ghosh's Tehsil Khana' Converting into 'Bangabandhu Postal Museum'
Gaurab Anindya & Ferdousi Nabila

Study on Paddy Land Fragmentation in Western Province, Sri Lanka
M. N. N Ranaweera, A.B. Jayasinghe, C.C. Abenayake & P.N.P. Wijayawaardana

Wearable Textile Sculpture of Toxic Masculinity
Gunawardena L. G. H. P. & Wickramasinghe D.P.U.M.

A Simulation Approach to Model Spatial Distribution of Population in Cities
Amila B. Jayasinghe , H. W. A. S. Sathsarana , R.M.Y.L. Rathnayake , C. C. Abenayake & P. K. S. Mahanama