Florina Dutt

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Florina Dutt is a Ph.D. candidate in the School of City and Regional Planning at Georgia Institute of Technology, USA. Her research interests include assessing the influence of the built environment on people's mental well-being, incorporating ideas of mental health in designing smart cities, and sustainable development. Her work with the Center for Spatial Planning Analytics and Visualization (CSPAV) at Georgia Tech involves use of applied machine learning techniques in processing large-scale social media data and application of GIS automation techniques for analysing fine grain built environment data. Apart form research, she has over 5 years professional experience in the field of urban planning, urban design, and architecture and also co-founded a design initiative called Caddisflai.

Academic Degrees

2016-2021
Graduating In DEC 2021

Georgia Institute of Technology, Atlanta, USA
Ph.D. in City and Regional Planning (GPA 3.87)
Major: Application of Urban Informatics in Urban Design | **Minor :** Social Computing
Dissertation Topic: Assessing Mental Well-being in Urban Areas Using Social Media Data: Understanding When and Where citizen's Stress and De-stress.

2014-2016

Master of City and Regional Planning (GPA 3.75)
Specialization: Sustainable Development, Urban Design, and Land Use

2009-2010

University of Pennsylvania, Philadelphia, USA
Master of Architecture (GPA 3.76)
Specialization: Sustainable Design, and Design Computing.
Thesis Topic: Computational design of a bio-inspired responsive architectural Façade system.

2003-2008

Jadavpur University, Kolkata, India
Bachelor of Architecture (GPA 3.68)
Thesis Topic: Designing Eco-Adaptable Residence in a Hot & Humid Climate in Kolkata, India.

Academic Appointments (Research Experience)

2017- Present

Georgia Institute of Technology, Atlanta, USA
Center for Spatial Planning and Visualization (CSPAV)
Graduate Research Assistant
Ph.D. Research: Identifying people's stress levels using large scale social media data (Tweets), and finding the association between stress and built environment characteristics such as streetscape, street-safety, density , diversity, and destination accessibility. Exploring natural language processing, and applied machine learning techniques for building stress, sentiment, and affect classifier.

Other Research: Assessing traveler's attitude and stress level using social media data. Exploring framework for transit oriented development (TOD) in Atlanta. Exploring design possibilities for active transportation/non-motorized transportation.

2016-2017

Eco-Urban Lab
Graduate Research Assistant
Research: Urban energy modeling, integrating geographic information system (GIS), and building energy modeling (BIM). Exploration of alternative energy use in neighborhoods.

2014- 2016

Imagine Lab
Graduate Research Assistant
Research: Developing framework for evaluating user-experience in university campuses.

2008- 2010

Carnegie Mellon University, Pittsburgh, USA
Center for Building Performance and Diagnostics
Graduate Researcher
Research: Exploring application of building energy modeling (BEM), performance analysis of intelligent workplace systems, technology research on net-zero buildings.

Research Grant Experience

2016- 2017

NSF Grant Projects

Engineering Research Center for Urban Agricultural Infrastructure Systems

Role: Conducted research on algae powered neighborhood, multiple publications, and conference presentation.

2014- 2015

RIPS - Participatory Modeling of Complex Urban Infrastructure Systems

Role: Conducting research on framework of transit oriented development (TOD) in Atlanta , data cleaning, data analysis, and visualizations.

Research Project Experience (refer **publications**)

Classification and Topic analysis of Text Data

2017 -2018

Assessment of travelers' attitudes and coping strategies during emergency events

Developed a system to capture historic Tweets and label them based on Traffic related topics and attitude. A semi- supervised labelling process is used to filter relevant Tweets and assign different topic categories (1) by hyper-parameter tuning, and (2) by feature engineering. Different Machine Learning models where compared before choosing the best performing models. Presented in ACSP conference 2018.

2018 -2019

Assessment of people's day -to activities using Tweets

Developed a system to capture Tweets real-time using Twitter 4J (A java based library to download Tweets using API). Semi- supervised labelling process is used to filter relevant Tweets and assign different topic categories by activities. Presented in ACSP conference 2019.

Measuring Mental Wellbeing (Stress, Affect, and Sentiment Analysis)

2019 -Present

Assessment of stress and affective quality of the Tweets (Dissertation)

Developed a system to assess the stress level and affective quality of the tweets. Tweets were initially hand labelled into different stress and affective quality labels. Next we used Feature engineered Tweets (weighting techniques based on affective words used in the Tweets) to build deep learning model to classify and score tweets for their stress level. Presented in ACSP conference 2020.

Interactive Modeling

2019 - 2020

Interactive modeling and comparison of sentiments (INMACS)

Collaboratively developed an interactive Auto-ML system that helps users to iteratively pre-process data (using natural language processing) to build topic and sentiment models. DaSH Workshop at KDD Conference 2020.

Built Environment Assessment (Processing Large Scale GIS Data)

2020 - present

Relationship Between Urbanness and mental wellbeing (Dissertation)

Developed python codes for processing large scale, fine grain, built environment data to measure accessibility and streetscape. Streetscape measurements include but not limited to building enclosure, effective street-width, tree enclosure , dead-ends etc. Other than physical entities, social-economic, crime, and environmental stress variables are also measured and estimated for large volume of Tweet locations. Proposed to be presented at ACSP 2021.

2016 - 2018

Gauging neighborhood potential for alternative energy generation techniques

Developed python based GIS data cleaning and data processing to estimate the energy generation potential for different neighbohoods characterized their scale and built-environment qualitiy. Published in Energy Procedia.

2017- 2018

Spatial implications of an urban redevelopment at Ponce City Market (PCM)

Studied the movement of pedestrians and visitors within and around Ponce City Market , and conducted topological and observational analyses to determine the internal spatial logic of the PCM and how it works as a system internally, and impact on surrounding blocks and functions. Project done in conjunction with Georgia Tech, and Jamestown Properties.

2009 - 2017

BIM and Design Computation

Extensive personal and collaborative experience developing BIM models for buildings, and in developing computational framework for energy efficient design systems both building and urban scale. Published in leading Computer Aided Architectural Design (CAAD) Conferences and Journals.

Academic Appointments (Teaching Experience)

Instructor

Fall, 2021

Intro to Urban Analytics (co-teaching)
Primarily taught crawling tweets using Twitter API , mining text data, sentiment analysis , and visualization.

Summer, 2021

Intro to Geographic Information System (co-teaching)
Geospatial Data Analysis and Visualization for Master of Urban Planning and Master of Science for Geographic Information Systems and Design.

Fall, 2020

Visualization for Planning
Data Visualization and Presentation Techniques for Master of Urban Planning and Master of Science for Geographic Information Systems and Design.

Teaching Assistant (TA)

Spring, 2019

Joint Urban Planning Studio (Georgia Institute of Technology + Indian Institute of Technology, Varanasi & Kharagpur, India)
The studio investigated three specific areas of Varanasi to come up with sustainable and implementable solution that fits the goal of Varanasi Smart City Master Plan.

Spring, 2017

Joint Urban Planning Studio (Georgia Institute of Technology + University of Tokyo)
The Studio investigated one of 2020 Summer Olympic Game sites, Urawa Misono, a satellite town of Tokyo's metropolitan region. The teams explored the role of smart city technologies, ecological performance modeling, and sustainability.

Fall, 2016

Urban Ecological Design
Teaching tools and techniques for site analysis and estimating energy performance of buildings.

Spring, 2016

Joint Urban Planning Studio (Georgia Institute of Technology+ Tongji University + Disney, Shanghai)
The studio team assisted Disney, Shanghai with the creation of evaluative tools and guidelines for designing a near net zero energy community south of the Disneyland theme park in Shanghai, China.

Invited Talks

Summer, 2019

Georgia Institute of Technology , School of City and Regional Planning
GIS Capstone Project Seminar
Use of Social Media Analytics in Urban Planning.

Spring, 2020

Shandong University, Qingdao, China
School of Computer Science, Guest Speaker Series
Assessment and mapping of stress levels in urban areas using Twitter data.

Industry Appointments

2017- Present

Caddisflai: generative deisgn studio
Co-founder
Role: Primarily focus on design decisions taken though research in generative design, and artificial intelligence to solve day-to-day problems in the built environment, urban spaces, products, and interactive visual systems.

Smallwood Renolds Stewart Stewart, Atlanta, USA

Summer, 2015

Urban Planner (summer Intern)
Preparing master plan for college campus in Florida, and mixed use developments such as retail and commercial in Atlanta, Georgia
Role: Developing conceptual, detail design, and visualizations

2011 -2014

Vast Design United Enterprise, Shanghai, China

Urban Planning - Project Manager

Prepare master plan for large scale landscape and infrastructure planning projects in Shanghai, Chongqing, Qingdao, and other cities in China.
Prepare master plan for large scale mixed use development including office, retail, hotels and residential, historic preservation and architecture projects.

Role:

Spatial & Demographic Data analysis, reviewing zoning codes, developing conceptual design to plan implementation, leading team work, review design and drawings.
Collaborating with city in preparing the stage-wise urban plans, urban design concepts.

2010 -2011

IAPA, Guangzhou, China

Urban Designer

Preparing master plan of large scale landscape, and urban design projects of culture parks and eco-parks in China.
Role: Developing conceptual design for master plan, detail design, and visualizations

2006 -2008
(Part-time)

Partha Das & Associates, Kolkata, India

Intern Architect

Preparing master plan of landscape, and urban design, and urban housing in Kolkata.

Publications

Work in Progress (for journal publication)

Are urbanites less stressed in active high-density areas with a high symbolic value? : An assessment using social computing and GIS automation. **Florina Dutt**, Subhrajit Guhathakurta.

Assessment of Citizen's Affect from Tweets in Different Urban Setting: Comparing Atlanta and Boston. **Florina Dutt**, Subhrajit Guhathakurta.

Assessment of travelers' attitudes and coping strategies during Atlanta's I-85 bridge collapse using Twitter. **Florina Dutt**, Subhajit Das, and Subhrajit Guhathakurta.

Fine-grained Geolocation Prediction of Tweets with Human Machine Collaboration, Subhajit Das, and **Florina Dutt,** *Cornell University archive, 2021*

Journal Publications

Framework for evaluating and optimizing algae façades using closed-loop simulation analysis integrated with BIM, Soowon Chang, Daniel Castro-Lacouture, Florina Dutt, and Perry Pei-Ju Yang, ***Energy Procedia***, 143, 237-244, 2017.

Decentralized algal energy system design at various urban densities and scales, Steven Jige Quan, Thomas K Igou, Soowon Chang, **Florina Dutt**, Daniel Castro-Lacouture, Yongsheng Chen, and Perry Pei-Ju Yang, ***Energy Procedia***, 143, 767–773, 2017.

Modeling algae powered neighborhood through GIS and BIM integration, **Florina Dutt**, Steven Jige Quan , Erik Woodworth, Deniel Castro-Lacouture, Ben J. Stuart, Yang, and Perry Pei Ju, Yang, ***Energy Procedia***, 105, 3830- 3836, 2017.

Local Climate Zone Mapping for Energy Resilience: A Fine-grained and 3D Approach, Steven Jige Quan, **Florina Dutt,** Yoshiki Yamagata, and Perry Pei Ju, Yang, ***Energy Procedia***, 105, 3777-3783, 2017.

Computational design of a bio inspired responsive architectural Façade system, **Florina Dutt**, and Subhajit Das, *International Journal of Architectural Computing*, 10(4), 613-633, 2012.

Peer Reviewed Conference Publications

Geospatial tool Evaluating job location mismatch, based on available workforce and transit options, **Florina Dutt**, and Subhajit Das, *8th ASCAAD Conference Proceedings*, London (United Kingdom), 557–566, 2016.

Design Optimization in a Hotel and Office Tower Through Intuitive Design Procedures and Advanced Computational Design Methodologies Facade design optimization by computational methods, Subhajit Das, and **Florina Dutt**, *30th International Conference Ecaade*, Prague (Czech Republic) 1, 235–243, 2012.

Responsive Architectural Surface Design from Nonlinear Systems Biology: Responsive Architectural Design by Computational Methods, **Florina Dutt**, and Subhajit Das, *17th International Conference on CAADRIA, Chennai (India)*, 465–474, 2012.

Designing Eco Adaptable Residence in a Hot & Humid, **Florina Dutt**, and Subhajit Das, *16th Iberoamerican Congress of Digital Graphics(SIGRADI),* Fortaleza (Brasil), 509–512, 2012.

Workshop Publications

InMacs: Interactive modeling and comparison of sentiments from sequence data, Subhajit Das, and **Florina Dutt**, *Workshop on Data Science with Human in the Loop (DaSH), at KDD conference*, 2020.

Interactive Glare Visualization Model for an Architectural Space, **Florina Dutt**, Subhajit Das, and Mathew Swarts, *4th International Regional eCAADe Workshop*, Novi Sad (Serbia), 97–107, 2016.

Eco-Urban Planning & Design for a futuristic vision of Shanghai, **Florina Dutt**, and Subhajit Das, *Master planning the Future*, Xi'an Jiaotong-Liverpool University, Suzhou (China) 239- 248, 2012

Poster Publications

Does access to diverse urban facilities reduce stress amongst urbanites? An assessment mining social media microblogs and points of interest, **Florina Dutt**, and Subhrajit Guhathakurta, Poster presentation, *Association of Collegiate School of Planning (ACSP) Annual Conference*, Oct 2021 *(Awared Best Poster)*.

Does choice of day-to-day activity location impact Mental Well-being? Mapping people's activities and associated stress levels form Tweets, **Florina Dutt**, and Subhrajit Guhathakurta, Poster presentation, *Association of Collegiate School of Planning (ACSP) Annual Conference*, Nov 2020 *(Awared Best Poster)*.

Citizen's Affect assessment in different urban settings, **Florina Dutt,** and Subhrajit Guhathakurta, *Career, Research, and Innovation Development Conference (CRIDC)*, Georgia Tech, 2019.

Design ornamentation & fabrication by multi agent systems, **Florina Dutt**, and Subhajit Das, *Special Interest Group on Computer Graphics and Interactive Techniques (SIGGRAPH)*, 2012.

Invited Conference Presentations

Are urbanites less stressed in active high-density areas with a high symbolic value? : An assessment using social computing and GIS automation, **Florina Dutt** (presenter), and Subhrajit Guhathakurta, *Association of Collegiate School of Planning (ACSP) Annual Conference* , Oct, 2021, online attendence.

Unveiling Urban Stress using Tweets: Modelling the Impact of Built Environment Stressors on Mental Well-being, **Florina Dutt** (presenter), and Subhrajit Guhathakurta, *Association of Collegiate School of Planning (ACSP) Annual Conference* , Nov, 2020, online attendance.

InMacs: Interactive modeling and comparison of sentiments from sequence data. **Florina Dutt** and Subhajit Das (presenter), *Workshop on Data Science with Human in the Loop (DaSH), at KDD conference,* Aug 2020, online attendance.

Assessment of Citizen's Affect from Tweets in Different Urban Setting: Comparing Atlanta and Boston, **Florina Dutt** (presenter), and Subhrajit Guhathakurta, *Association of Collegiate School of Planning (ACSP) Annual Conference* , Oct, 2019 , Greenville, North Carolina.

Assessment of Citizen's 'Affect' from Tweets in Different Urban Setting: Comparing Atlanta and Boston, **Florina Dutt** (presenter), and Subhrajit Guhathakurta, *Georgia Planning Association (GPA) FALL Conference* , Sept 2019 , Athens, Georgia.

Assessment of travelers' attitudes and coping strategies during Atlanta's I-85 bridge collapse using Twitter, **Florina Dutt** (presenter), and Subhrajit Guhathakurta, *Association of Collegiate School of Planning (ACSP) Annual Conference*, Oct, 2018, Buffalo, New York.

Assessment of travelers' attitudes and coping strategies during Atlanta's I-85 bridge collapse using Twitter, **Florina Dutt** (presenter), and Subhrajit Guhathakurta, *Georgia Planning Association (GPA) FALL Conference*, Sept 2018, Jekyll Island, Georgia.

Modeling algae powered neighborhood through GIS and BIM integration, **Florina Dutt** (presenter), Steven Jige Quan, Erik Woodworth, Daniel Castro-Lacouture, Ben J Stuart, Perry Pei-Ju Yang, *Southeast Recycling Conference (SERC)*, March 2017, Destin, Florida.

Reclaiming the Public Realm to Improve Human Health and the Environment: Urban form and non-motorized transportation in Indian cities, Subhrajit Guhathakurta (presenter) and **Florina Dutt,** *International Seminar on Planning for Sustainable and Inclusive Urban Development in India: Learning from International Experiences and Future Strategies*, Aug 2015, New Delhi (India).

Skills

Statistical Analysis
SPSS, R, Python (numpy, pandas, scikit learn) ,Tableau, Excel
Programming Skills
R, Python
Spatial Analysis
ArcGIS, QGIS , Depth Map, Arcpy and other open source python libraries for GIS automation and spatia data processing
Text Mining
Text preprocessing , NLP Analysis, Deep Learning
2D Graphics
Adobe- InDesign, Photoshop, Illustrator
3D Modeling & BIM
Auto Cad, Revit, 3DS Max, Rhino, Maya, Sketchup
Parametric Modeling Tools
Grasshopper, Dynamo
Energy Simulation Tools
Green Building Studio, Ecotect, Equest, Energy Plus

Analytics Courses
Advanced GIS
Quantitative Research Methods
Qualitative Research Methods
Design Scripting
Urban Spatial Analytics (Space Syntax)
Database management and Machine Learning
Social Computing
Survey Design Methods

Teaching and Learning Courses
Gratuate Student Instructor (GSI) Seminar
Fundamentals of Teaching and Learning
Course Designing
Teaching Capstone

Award & Honors

Tech to Teaching Certificate Center for Teaching and Learning, Georgia Institute of Technology | 2021
RIBA certificate (Top 60 best design proposal) in Ancient Tree Village Planning Compretition | 2021
3rd Prize in A8' Design Competition for post -pandemic urban seating | 2021
Reflective Teaching Badge, Center for Teaching and Learning, Georgia Institute of Technology | 2020
Best Poster, Association of Collegiate School of Planning (ACSP) | 2020
Finalist, Urban Land Institute (ULI) Student Competition | 2016
Travel Award for Joint Urban Planning Studio, Disney Shanghai | 2016
Glatin Jackson Kecher Anglin Fellowship | 2015
Best Annual Urban Planning Project Award, Vast Design United Enterprise | 2012
Registered Architect in Council of Architecture India| 2008
Finalist, Water Safe and Sustainable Design Competition | 2008
Pedilite Award of Excellence for Young Designer | 2008
1st runner up, Indian Green Building Design Competition | 2007
2nd runner up, Indian Green Building Design Competition | 2006
1st Prize, Saint Gobain Glass Design Competition | 2006