Curriculum Vitae

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Education

2015/05/20, *PhD* in Geographical Sciences, University of Maryland, College Park
2009/06/01, *BS* in Geographical Information System, Nanjing University

Employment

2017/07/01 ~ present, Assistant Research Professor, University of Maryland
2015/07/01 ~ 2017/06/30, GEDI Post-Doctoral Associate, University of Maryland
2009/08/02 ~ 2015/05/30, Graduate Research Assistant, University of Maryland

Publications

Refereed Journals

Dubayah, R., Blair, J.B., Goetz, S., Fatoyinbo, L., Hansen, M., Healey, S., Hofton, M., Hurtt, G., Kellner, J., Luthcke, S., Armston, J., **Tang, H.**, Duncanson, L., Hancock, S., Jantz, P., Marselis, S., Patterson, P., Qi, W., Silva, C., 2020. The Global Ecosystem Dynamics Investigation: High-resolution laser ranging of the Earth's forests and topography. *Sci. Remote Sens.* 100002.

Rödig, E., Knapp, N., Fischer, R., Bohn, F., Dubayah, R., **Tang. H,** Huth A. (2019) From small-scale forest structure to Amazon-wide carbon estimates. *Nature Communications.* 10, 5088.

Suzanne Marselis, **Tang**, **H.**, John Armston, Katharine Abernethy, Alfonso Alonso, Nicolas Barbier, Pulchérie Bissiengou, Kathryn Jeffery, David Kenfack, Nicolas Labrière … (2019) Exploring the relation between remotely sensed vertical canopy structure and tree species diversity in Gabon. *Environmental Research Letters.*

Tang, H., Armston, J.D., Hancock, S., Marselis, S.M., Goetz, S., Dubayah, R., (2019). Characterizing global forest canopy cover distribution using spaceborne lidar. *Remote Sensing of Environment*. 231.

Huang, W., Dolan, K., Swatantran, A., Johnson, K., **Tang, H.,** O'Neill Dunne, J., Dubayah, R., Hurtt, G. (2019). High-resolution mapping of above ground biomass for forest carbon monitoring system in the tri-state region Maryland, Pennsylvania, Delaware, USA. *Environmental Research Letters*.

Hurtt, G., Zhao, M., Sahajpal, R., Armstrong, A., Birdsey, R., Campbell, E., Dolan, K., Dubayah, R., Fisk, J.P., Flanagan, S., Huang, C., Huang, W., Johnson, K., Lamb, R., Ma, L., Marks, R., O'Leary, D., O'Neil-Dunne, J., Swatantran, A., **Tang, H**., (2019). Beyond MRV: high-resolution forest carbon modeling for climate mitigation planning over Maryland, USA. *Environmental Research Letters.* 045013.

Tang, H., Song, XP., Zhao, F., Strahler, A.H., Schaaf, C.L., Goetz, S., Huang, C., Hansen, M., Dubayah, R., (2019) Definition and measurement of tree cover: A comparative analysis of field-, lidar-and landsat-based tree cover estimations in the Sierra national forests, USA. *Agricultural and Forest Meteorology*. 268, 258-268.

Hancock, S., Armston, J., Hofton, M., Sun, X., **Tang, H**., Duncanson, L., Kellner, J., Dubayah, R. (2019) The GEDI Simulator: A Large-Footprint Waveform Lidar Simulator for Calibration and Validation of Spaceborne Missions. *Earth and Space Science*. 6(2), 294-310. (*TOP CITED ARTICLE 2018-2019*)

Qi, W., Lee, SK., Hancock, S., Luthcke, S., **Tang, H**., Armston, J., Dubayah, R., (2019). Improved forest height estimation by fusion of simulated GEDI Lidar data and TanDEM-X InSAR data. *Remote Sensing of Environment*. 221, 621–634.

Marselis, S.M., **Tang, H.**, Armston, J.D., Calders, K., Labrière, N., Dubayah, R., (2018). Distinguishing vegetation types with airborne waveform lidar data in a tropical forest-savanna mosaic: A case study in Lopé National Park, Gabon. *Remote Sensing of Environment*. 216, 626–634.

Tang, H., & Dubayah, R. (2017). Light-driven growth in Amazon evergreen forests explained by seasonal variations of vertical canopy structure. *Proceedings of the National Academy of Sciences*. 114(10), 2640-2644.

Tang, H., Swatantran, A., Barrett, T., DeCola, P., & Dubayah, R. (2016). Voxel-Based Spatial Filtering Method for Canopy Height Retrieval from Airborne Single-Photon Lidar. *Remote Sensing*, 8(9), 771.

Brolly, M., Simard, M., **Tang, H.**, Dubayah, R. O., & Fisk, J. P. (2016). A Lidar-Radar Framework to Assess the Impact of Vertical Forest Structure on Interferometric Coherence. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, PP(99), 1–12.

Swatantran, A., **Tang, H.**, Barrett, T., DeCola, P., & Dubayah, R. (2016). Rapid, High-Resolution Forest Structure and Terrain Mapping over Large Areas using Single Photon Lidar. *Scientific Reports*, 6, 28277.

Tang, H., Ganguly, S., Zhang, G., Hofton, M., Nelson, R., & Dubayah, R. (2016). Characterizing leaf area index (LAI) and vertical foliage profile (VFP) over the United States. *Biogeosciences* 13, 239-252

Huang, W., Swatantran, A., Johnson, K., Duncanson, L., **Tang, H.**, O'Neil Dunne, J., Hurtt, G., & Dubayah, R. (2015). Local discrepancies in continental scale biomass maps: a case study over forested and non-forested landscapes in Maryland, USA. *Carbon Balance and Management* C7 - 19, 10, 1-16

Tang, H., Brolly, M., Zhao, F., Strahler, A.H., Schaaf, C.L., Ganguly, S., Zhang, G., & Dubayah, R. (2014a). Deriving and validating Leaf Area Index (LAI) at multiple spatial scales through lidar remote sensing: A case study in Sierra National Forest, CA. *Remote Sensing of Environment, 143*, 131-141

Tang, H., Dubayah, R., Brolly, M., Ganguly, S., & Zhang, G. (2014b). Large-scale retrieval of leaf area index and vertical foliage profile from the spaceborne waveform lidar (GLAS/ICESat). *Remote Sensing of Environment*, 154, 8-18

Zhao, F., Yang, X.Y., Strahler, A.H., Schaaf, C.L., Yao, T., Wang, Z.S., Roman, M.O., Woodcock, C.E., Ni-Meister, W., Jupp, D.L.B., Lovell, J.L., Culvenor, D.S., Newnham, G.J., **Tang, H.**, & Dubayah, R.O. (2013). A comparison of foliage profiles in the Sierra National Forest obtained with a full-waveform under-canopy EVI lidar system with the foliage profiles obtained with an airborne full-waveform LVIS lidar system. *Remote Sensing of Environment*, 136, 330-341

Tang, H., Dubayah, R., Swatantran, A., Hofton, M., Sheldon, S., Clark, D.B., & Blair, B. (2012). Retrieval of vertical LAI profiles over tropical rain forests using waveform lidar at La Selva, Costa Rica. *Remote Sensing of Environment*, 124, 242-250

Referred Conference Proceedings

H Tang, J Armston, S Hancock, S Marselis, S Luthcke, M Hofton, B Blair, R Dubayah (2018) Development of the Global Ecosystem Dynamics Investigation (GEDI) Lidar Canopy Cover and Vertical Profile Metrics Algorithm and Validation Results. Oct 1-4, College Park, *ForestSAT* 2018.

Song, X.P. and **H. Tang** (2015) Accuracy assessment of Landsat-derived continuous fields of tree cover products using airborne Lidar data in the Eastern United States. The International Archives of Photogrammetry, *Remote Sensing and Spatial Information Sciences*, 40(7), pp. 241-246.

Tang, H., Swatantran, A., DeCola, P., Barrett, T., & Dubayah, R. Improved canopy height measurements of single photon lidar (SPL) using a multistage noise filtering method. *Proceedings of SilviLaser 2015*, September 28-30, La Grande Motte, France.

Conferences, Workshops, and Talks

Invited Talks

Mapping Global Canopy Cover and Vertical Profile Metrics using Spaceborne Lidar, invited by Earth System Science Interdisciplinary Center (ESSIC), 11/1/2018.

Characterizing Forest Structure Dynamics using Lidar Remote Sensing—on the ground, in the air and from Space, invited by University of Connecticut, 5/1/2018.

Lidar remote sensing of vertical foliage profile and leaf area index, invited by Beijing Normal University, 11/09/2016.

Derving vertical LAI profiles over tropical rain forests using a medium footprint waveform lidar, invited by Chinese Academy of Forestry, 10/12/2013.

Refereed Presentations

Tang et al. (2019) Measuring global forest structure using spaceborne lidar remote sensing, Ecological Society of America (ESA) meeting, Louisville, KY.

Tang et al. (2018) Mapping Global Canopy Cover and Vertical Profile Metrics using Spaceborne Lidar, American Geophysical Union (AGU) 2018 Fall Meeting

Tang, H. Lidar observed seasonal variation of vertical canopy structure in the Amazon evergreen forests. American Geophysical Union (AGU) Fall Meeting 2017.

Tang, H., Pre-launch testing of GEDI canopy cover and vertical profile data product algorithms in African tropical rainforests. SilviLaser 2017, Blacksburg, USA. 2017.

Tang, H., An Assessment of Differences in Tree Cover Measurements between Landsat and Lidar-derived Products. American Geophysical Union (AGU) Fall Meeting 2016.

Tang, H., Large Scale Mapping of Vegetation Structure and Terrain Surface using Single Photon Lidar (SPL). American Geophysical Union (AGU) Fall Meeting 2015.

Tang, H., Improved canopy height measurements of single photon lidar (SPL) using a multistage noise filtering method. SilviLaser 2015, La Grande Motte, France. 2015.

Tang, H., First Near-Continental Leaf Area Index (LAI) and Vertical Foliage Profile (VFP) Product from the Geoscience Laser Altimeter System (GLAS). American Geophysical Union (AGU) Fall Meeting 2014.

Tang, H., A new algorithm of deriving canopy height and leaf area index from lidar remote sensing. Annual meeting for the Association of American Geographers (AAG), Tampa, FL. 2014.

Tang, H., Lidar Remote Sensing of Vertical Foliage Profile (VFP) and Leaf Area Index (LAI). *NASA LCLUC Science Team Meeting*, Rockville, MD. 2014.

Tang, H., Deriving and validating leaf area index (LAI) using multiple lidar systems. 13th International Conference on LiDAR Applications for Assessing Forest Ecosystems. SilviLaser 2013, Beijing, China. 2013.

Tang, H., Deriving Leaf Area Index (LAI) from multiple lidar remote sensing systems. American Geophysical Union (AGU) Fall Meeting 2012.

Tang, H., Deriving LAI and vertical foliage profile from waveform lidar remote sensing. Annual meeting for the Association of American Geographers (AAG), Los Angeles, CA. 2012.

Tang, H., Analysis of Tropical Forest Structure Dynamics Using Medium-footprint Lidar and Landsat Time Series Stacks. American Geophysical Union (AGU) Fall Meeting 2011.

Tang, H., Rain forest LAI retrieval using both medium footprint and small footprint airborne scanning LIDAR. Annual meeting for the Association of American Geographers (AAG)**,** Seattle, WA. 2011.

Tang, H., Sensitivity of LIDAR Canopy Height Estimate to Geolocation Error. American Geophysical Union (AGU) Fall Meeting 2010.

Completed Creative Works

Datasets

Dubayah R., Luthcke, S., Blair, J. B., Hofton, M., Armston, J., Tang, H. (2020). GEDI L1B Geolocated Waveform Data Global Footprint Level V001 [Data set]. NASA EOSDIS Land Processes DAAC. https://doi.org/10.5067/GEDI/GEDI01_B.001

Dubayah R., Hofton, M., Blair, J. B., Armston, J., Tang, H., Luthcke, S. (2020). GEDI L2A Elevation and Height Metrics Data Global Footprint Level V001 [Data set]. NASA EOSDIS Land Processes DAAC. https://doi.org/10.5067/GEDI/GEDI02_A.001

Dubayah R., Tang, H., Armston, J., Luthcke, S., Hofton, M., Blair, J. B. (2020). GEDI L2B Canopy Cover and Vertical Profile Metrics Data Global Footprint Level V001 [Data set]. NASA EOSDIS Land Processes DAAC. https://doi.org/10.5067/GEDI/GEDI02_B.001

Tang, H., J. Armston, S. Hancock, M. Hofton, J.B. Blair, T. Fatoyinbo, and R.O. Dubayah. 2018. AfriSAR: Canopy Cover and Vertical Profile Metrics Derived from LVIS, Gabon, 2016. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1591

Dubayah, R.O., A. Swatantran, W. Huang, L. Duncanson, K. Johnson, H. Tang, J.O. Dunne, and G.C. Hurtt. 2017. CMS: LiDAR-derived Aboveground Biomass, Canopy Height and Cover, Sonoma County, California, 2013. ORNL DAAC, Oak Ridge, Tennessee, USA.

Dubayah, R.O., A. Swatantran, W. Huang, L. Duncanson, K. Johnson, H. Tang, J.O. Dunne, and G.C. Hurtt. 2016. CMS: LiDAR-derived Aboveground Biomass, Canopy Height and Cover for Maryland, 2011. ORNL DAAC, Oak Ridge, Tennessee, USA.

Sponsored Research Grants

Microsoft, AI for Earth Microsoft Azure Compute Grant, Forest carbon mapping and individual tree delineation in the state of Maryland, $15,000, 08/08/2019 (PI).

NASA New (Early Career) Investigator Program in Earth Science, Integrating Space-Borne Lidar Observations to Characterize Vegetation Structure Dynamics across Tropical Forests, $264,576, 04/01/2018 - 03/31/2021 (PI).

NASA, Determining Tropical Rain Forest Successional States Using Vertical Leaf Area Index (LAI) Profiles, $90,000, 09/01/2012 - 08/31/2016 (Co-PI, PI: Ralph Dubayah).

Research Fellowships, Prizes and Awards

2018, Top 10 Best Reviewers Award of *Remote Sensing of Environment*

2015, Excellence in Graduate Research Award in the Department of Geographical Sciences of the University of Maryland, College Park.

2015, Chinese Government Award for Outstanding Self-Financed Students Abroad

2014, Excellence in Graduate Research Award in the Department of Geographical Sciences of the University of Maryland, College Park.

2012 ~ 2015, NASA Earth System Science Fellowship

2009, Outstanding undergraduate thesis in Geography of Jiangsu Province

2008, First class honor of the Chinese National University Student Renovation Project: Public transportation stream of Nanjing from the view of Free-Scale Network

2005 ~ 2006, Undergraduate Scholarship of Nanjing University

Teaching

Courses Taught

2019, Advanced Remote Sensing Using Lidar (GEOG 660) (16 students)
2018, Advanced Remote Sensing Using Lidar (GEOG 660) (9 students)
2014, Introduction to GIS (GEOG 579a) (9 students)
2014, Introduction to Remote Sensing (GEOG 579b) (14 students)

Courses TA

2014, Geographic Information Systems (GEOG 373) (38 students)

Service and Outreach

Editorships and Editorial Boards

Guest Editor of *Environmental Research Letters* and *Journal of Applied Remote Sensing*

Reviewing Activities for Journals and Presses

Agricultural and Forest Meteorology, IEEE Geoscience and Remote Sensing Letters (GRSL), Canadian Journal of Remote Sensing, Conservation Biology, Environmental Research Letters, IEEE Trans. on Geoscience and Remote Sensing, IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing (JSTARS), International Journal of Digital Earth, ISPRS Journal of Photogrammetry and Remote Sensing , Journal of Geophysical Research – Biogeosciences, Methods in Ecology and Evolution, Nature Ecology & Evolution, New Phytologist, PLOS ONE, Remote Sensing, Remote Sensing of Environment ***(* the Excellent Reviewer of 2018),*** *Reviews of Geophysics, Sensors, Scientific Reports, Urban Forestry & Urban Greening*

Reviewing Activities for Conferences

AGU conference student judge

Committees, Professional & Campus Service

Campus Service – Department

2009 ~ 2010, Research representative, Dept. of Geography University of Maryland

Campus Service – Other

2010 ~ 2011, Secretary, Chinese Student and Scholar Association, University of Maryland

Professional Memberships

American Association of Geographers
American Geophysical Union
NASA Global Ecosystem Dynamics Investigation (GEDI) Science Team
NASA Carbon Monitoring System (CMS) Science Team

Notarization. I have read the following and certify that this CV is a current and accurate statement of my professional record.

Signature  Date: March 1, 2020