

# Atesmachew Hailegiorgis

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## Education

- 2008–2013 **Ph.D.**, *Computational Social Science*, George Mason University, Virginia. USA.  
○ Dissertation: Computational Modeling of Climate Change, Land Acquisition, and Household Dynamics in Southern Ethiopia (Prof. Claudio Cioffi-Revilla, Chair)
- 2002–2004 **MSc.**, *Geo-Information Science*, Wageningen University, Netherlands.
- 1996–2000 **BSc.**, *Forestry*, Debu University, Ethiopia.

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## Research Interests

- Exploring and understanding complex coupled human and natural systems particularly related to agricultural productivity and environmental sustainability, climate change, landuse dynamics, diseases and disasters using geographical information systems (GIS), spatial and statistical analysis, social networks, and agent-based modeling methodologies.

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## Research Grant and Honor Awards

- 2012–2014 **National Science Foundation, US National Science Foundation NSF/DDIR Program.** Hailegiorgis A.B., DDRI (Doctoral Dissertation Research Initiative) grant no. 112348, “Computational Modeling of the Effects of Climate Change and Land Acquisition on Household Dynamics in Southern Ethiopia,” Co-Principal Investigator
- 2002–2004 Netherlands University Fellowship program (NUFFIC) award

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## Employment Experience

- 2014–current **Research Assistant Professor**, *Center for Social Complexity*, George Mason University, Virginia.  
USA  
○ Collaborated in research projects focused on GIS, coupled human and natural systems, climate change, disease and refugee camps  
○ Developed spatial agent-based models to simulate coupled human and natural systems, diseases, and disasters
- 2008–2013 **Graduate Research Assistant**, *Department of computational Social Science*, George Mason University, Virginia.  
USA  
○ Collaborated in research projects focused on GIS, coupled human and natural systems, climate change, disease and refugee camps  
○ Developed spatial agent-based models to simulate coupled human and natural systems, diseases, and disasters  
○ Provided GIS analysis and modeling support for various research projects

- 2005–2008 **GIS Officer**, *United Nation Office for the Coordination of Humanitarian Affairs (UN-OCHA)*, Addis Ababa, Ethiopia.
- Setup, developed, managed, analyzed, and produced spatial data, maps, documents, spatial databases to support humanitarian activities
  - Coordinated and led a mutiagency GIS working groups to promote coordination and information-sharing between humanitarian organizations
  - Provided GIS and remote sensing training to different government and non-government organizations
- 2004–2005 **GIS Analyst**, *International Livestock Research Institute (ILRI)*, Addis Ababa, Ethiopia.
- Provided GIS and remote sensing support and services for various research projects
  - Provided GIS and remote sensing training
  - Developed and maintained spatial database
  - Conducted research on livestock management, soil conservation, rangeland management
- 2001–2002 **Grant Facilitator**, *World Vision*, Addis Ababa, Ethiopia.
- Facilitated planning, monitoring, reporting and evaluating of grant and relief projects
  - Coordinated early warning system development and data collection through market survey, nutritional survey, socio-economic, crop assessment, rainfall data and other means and writing report on the findings
  - Produced and participated development activities in the project areas on the following major activities: environmental rehabilitation, afforestation, soil conservation

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## Teaching Experience

- 2008–2013 **George Mason University**. Guest Lecturer for the following courses: Introduction to Geographic Information Systems (GGS 311), International Health Policy and Practice (GCH405), Perspectives on Food Security (NUTR 608)
- 2005–2008 **UNOCHA**. Provided GIS training (Introductory to GIS)
- 2004–2005 **ILRI**. Provided basic and advanced GIS and Remote Sensing training

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## Computer skills

- OS Linux, Unix, Windows
- Programming JAVA, Python, scripting
- Scientific ArcGIS, GRASS, ERDAS, ENVI, MATLAB, R, ORA, NetworkX, MASON, REPAST, NETLOGO

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## Affiliations

- Member of Computational Social Science Society of the Americas (CSSSA).
- Member of Association of American Geographers (AAG).
- Member (Founding) of GIS Society of Ethiopia,(GISSA).

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## Publications in Peer-Reviewed Journals

- Cioffi-Revilla, Claudio, Rogers, J.D. and **Hailegiorgis, A.B.** (2011).“Geographic Information Systems (GIS) and Spatial Agent-Based Model (ABM) Simulations for Sustainable Development.” *ACM Transactions on Intelligent Systems and Technology* 3(1).

- Taye Gidyew, Tadesse, G., Jobre, Y., **Hailegiorgis A.B.**, Asrat, M., and Getahun, Y. (2007). "Application of GIS in Assessing Land Degradation and Livestock Feed Availability in the Blue Nile Basin." *Ethiopian Veterinary Journal*, 11(2).
- Hailegiorgis, A.B., Tadesse, G., Sonder, K., Peden, D., and Jobre, Y. (2006). "Comparative assessment of forage and livestock density in Tekeze River Basin". *Ethiopian Veterinary Journal*, 10(2).
- **Hailegiorgis, A.B.**, Tadesse, G., Sonder, K., Peden, D., Jobre, and Y. Getahun, Y. 2006. "Application of Geographic Information Systems (GIS) for the classification of production systems and determination of grazing pressure in uplands of the Awash River Basin." *Ethiopian Veterinary Journal*, 10(1).

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## Conference Proceedings

### Peer-Reviewed

- **Hailegiorgis, A.B.**, Crooks, A.T. and Cioffi, C. (2013), Agent-Based Modeling for Analyzing HADR Issues: Disease in Refugee Camps, Pacific Operational Science and Technology Conference, 5th - 8th March, Honolulu, HI.
- Crooks, A.T. and **Hailegiorgis, A.B.** (2012), Disease Modeling Within Refugee Camps: A Multi-agent Systems Approach, in Pasupathy, R., Kim, S.-H., Tolk, A., Hill, R. and Kuhl, M. E. (eds.), *Proceedings of the 2013 Winter Simulation Conference*, Washington, DC.
- **Hailegiorgis, A.B.** and Crooks, A.T. (2012) Agent based modeling for humanitarian issues: Diseases and refugee camps. *Computational Social Science Society of the Americas (CSSSA2012)*, Santa Fe, NM. 18-21 September 2012.
- Gulden T, Cotla CR, **Hailegiorgis A.B.**, and Crooks A.T. 2011. A Generic Vegetation Growth Sub-model in a Large Human/Environment Interaction Model of East Africa. *Computational Social Science Society of the Americas (CSSSA2011)*, Santa Fe, NM. 9-12 October 2011.
- Kennedy, W.G., **Hailegiorgis, A.B.**, Rouleau, M., Bassett, J.K., Coletti, M., Balan, G.C., Gulden, T., and Cioffi-Revilla, C. (2010) "MASON HerderLand: Origins of Conflict in East Africa". *Computational Social Science Society*, Tempe, AZ. 5-6 November 2010.
- Kennedy, W.G., **Hailegiorgis, A.B.**, Gulden, T., Bassett, J.K., Coletti, M., Balan, G.C., Clark, M. and Cioffi-Revilla, C. (2010) "An Agent-Based Model of Conflict in East Africa and the Effect of the Privatization of Land." *Proceedings of the 3rd World Congress on Social Simulation*, Kassel, Germany, September 6-9, 2010.
- **Hailegiorgis, A. B.**, Kennedy, W. G., Rouleau, M., Bassett, J. K., Coletti, M., Balan, G. C., and Gulden, T. (2010). An agent based model of climate change and conflict among pastoralists in East Africa. *Proceedings of the International Congress on Environmental Modeling and Software (IEMSS2010)*, Ottawa, Ontario, Canada. 5-8 July 2010.
- Kennedy, W.G., **Hailegiorgis, A.B.**, Rouleau, M., Bassett, J.K., Coletti, M., Balan, G.C., and Gulden, T. (2010) An Agent-Based Model of Conflict in East Africa and the Effect of Watering Holes, *Proceedings of the 19th Conference on Behavior Representation in Modeling and Simulation*, Charleston, SC. 21-24 March 2010.
- Rouleau, M., Coletti, Bassett, J.K., **Hailegiorgis, A.B.**, Gulden, T., and Kennedy, W.G., (2009) Conflict in Complex Socio-Natural Systems: Using Agent-Based Modeling to Understand the Behavioral Roots of Social Unrest within the Mandera Triangle. Paper presented at the *Human Behavior Computational Modeling and Interoperability Conference 2009*. Oak Ridge, TN. 23-24 June 2009.

## Non Peer-Reviewed

- **Hailegiorgis, A.B.** and Cioff-Revilla, C. (2013) OMOLAND: A Spatial Agent-Based Modeling Approach to Climate Change Adaptation, Large-scale Land Acquisition, and Rural Household Dynamics. AfricaGIS 2013. Global Geospatial Conference 2013. Addis Ababa, Ethiopia. November 4-8, 2013
- **Hailegiorgis, A.B.** (2013) An Agent-Based Modeling of Climate Change Adaptation in Southern Ethiopia. Association of American Geographers (AAG2013); Los Angeles. 9-12 April 2013.
- Crooks, A.T. and **Hailegiorgis, A.B.** (2013) Modeling the Spread of Cholera within Refugee Camps: An Agent-Based Modeling Approach. Association of American Geographers (AAG2013); Los Angeles. 9-12 April 2013.
- Crooks, A.T. and **Hailegiorgis, A.B.** (2012), The Spread of Cholera in Dadaab Refugee Camps: An Agent Based Modeling Perspective, 59th Annual North American Meetings of the Regional Science Association International, 7th -10th, November, Ottawa, Canada.
- **Hailegiorgis, A.B.** (2012) An Agent-Based Modeling of Climate Change, Land Acquisition, and Household Dynamics in Southern Ethiopia. Association of American Geographers (AAG2012); New York. 24-28 February 2012.

## Paper Under Preparation

- **Hailegiorgis, A.B.** (2013) An Agent-Based Modeling of Climate Change Adaptation in Southern Ethiopia. Association of American Geographers (AAG2013); Los Angeles. 9-12 April 2013.
- Crooks, A.T. **Hailegiorgis, A.B.** (2013) Modeling the Spread of Cholera within Refugee Camps: An Agent-Based Modeling Approach. Association of American Geographers (AAG2013); Los Angeles. 9-12 April 2013.
- **Hailegiorgis, A.B.** (2012) An Agent-Based Modeling of Climate Change, Land Acquisition, and Household Dynamics in Southern Ethiopia. Association of American Geographers (AAG2012); New York. 24-28 February 2012.

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## Other Activities

### Summer School Attended

- CASOS 2011 Summer Institute. "Dynamic network analysis and computational modeling of complex socio-technical systems." 13-19 June 2011. Carnegie Mellon University, PA.
- Lipari School on Computational Social Science. "Computational Social Science: text and Decisions". 16-23 July 2011. Lipari, Italy.

### Field Research

- 2012. Field research in South Omo, Ethiopia.
- 2010. Field research in East Africa: Kenya (Nairobi and districts of Mombasa, Marsabit, Turkana), Uganda (Kampala, Lake Victoria, Lake Tivu), Rwanda (Kigali and environs)

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## References

- **Claudio Cioffi-Revilla, Ph.D.** Professor and Director of Center for Social Complexity. Department of Computational Social Science. Krasnow Institute for Advanced Study. George Mason University. 4400 University Drive MSN 6B2. Fairfax VA 22030. Phone: (703) 993-1402 Email: ccioffi@gmu.edu
- **William G. Kennedy, Ph.D.** Research Assistant Professor. Center for Social Complexity. Department of Computational Social Science. Krasnow Institute for Advanced Study. George Mason University. 4400 University Drive MSN 6B2 Fairfax VA 22030. Phone: (703) 993-4929 Email: wkennedy@gmu.edu
- **Andrew Crooks, Ph.D.** Assistant Professor and Director of Graduate Studies. Department of Computational Social Science. Krasnow Institute for Advanced Study. George Mason University. 4400 University Drive MSN 6B2 Fairfax VA 22030. Phone: (703) 993-4640 Email: acrooks2@gmu.edu