IS-GEO RCN Kickoff Working Meeting

January 18-20, 2017
University of Texas at Austin

https://is-geo.org/events/workshop-2017/

Agenda

Wednesday January 18:
Day 1 - Identifying Initial Connection Points

8:00-8:30am Welcome and breakfast

8:30-9am Introductions and overview of the RCN, activities to date, meeting schedule and goals

9-10:30am Introductory Lightning Talks (Chair: Yolanda Gil)

- 2 min talks by each meeting participant
- *Prepare ahead of time: a 2min/2 slides research overview by each participant, mention what collaborations are you looking for, email slides ahead of time*

10:30-11am Break

11 - 12:30pm IS-centered World Cafe I: Initial discussions (Chair: Mariana Guereque)

- Identify common research interests of the group. Breakout is based on IS core themes (based on research areas in Figure 9 of the IS-GEO workshop report)
    - Model-driven sensing – David Thompson
    - Knowledge maps – Craig Knoblock
    - Theory-guided learning – Victor Pankratius
    - Trusted threads – Beth Plale
    - Interactive analytics – Deana Pennington
- *Prepare ahead of time: Leads propose topics to discuss at each table*

12:30-2pm Lunch (provided) and demos/discussions

2-3:30pm GEO-centered World Cafe I: Initial discussions (Chair: Katie Skinner)

- Identify common research interests of the group on GEO core themes

    - Atmospheric + Ocean + Polar – Sai Ravela, Juan Restrepo
    - Geospace – Victor Pankratius, David Thompson
    - Earth sciences – Enrique Cabral, Suzanne Pierce
- *Prepare ahead of time: Leads propose topics to discuss at each table*

3:30-4pm Break

4:00-5:00 pm Lexithon (Chair: Daniel Garijo)

- Introduce the "Lexithon" activity and the semantic wiki
- Discuss terms to add based on the discussions of Day 1
- Paired discussion activity about a selected set of terms
- *Set up: 1 wiki page per researcher contributing, describing their background and with pointers to their own work*
- *Prepare ahead of time: Sample terms and wiki entries*

5:00-5:30 pm Status check on ongoing and new publications

- Yolanda Gil: Longer paper for AI researchers, focused on IS challenges, send to CACM: Something like "10 challenges in IS-GEO". Figure 4 in the 2015 workshop report introduces several of them.
- Imme Ebert-Uphoff: Article on ML challenges from GEO data, basically based on Fig. 7 of the 2015 workshop report. Audience: Machine learning scientists. Topic: Typical properties of data sets in geosciences. Basically: Take the table in Fig. 7 and illustrate the properties using examples from report. Imme Ebert-Uphoff (lead), with Vipin Kumar, Hassan Ali Babaie, Anuj Karpatne, Sai Ravela. Goal is to describe several geo challenges and the ML research questions they raise. There is a draft, may be submitted to the SIAM workshop.
- Basil Tikoff: Longer IS-GEO overview for geoscientists, based on Figure 6 in the 2015 workshop report. Target Computers and Geosciences journal: Basil (lead), with Mary, Suzanne, Yolanda. Suzanne and Yolanda to create version 0 from the IS-GEO NSF report.
- Suzanne Pierce: Short IS-GEO overview for geosciences: Science Commentary article [other other publication venue like Nature Geoscience or GSA Today or EOS] potential impact for IS-GEO to societal issues - Paper to Geo community: What is possible from IS side? Educate geoscientists about capabilities provided by IS methods. Suzanne (lead), Mary, Basil. There is a draft.
- Imme Ebert-Uphoff: Author a paper on state of education for IS-GEO, including all the choices educators have to make, e.g. target groups (undergrad/grad/young career/mid career), depth (one course, degree, short courses, tutorials), target audience discipline

(geo/intelligent systems). Potential format to get started (then add more info): Ebert-Uphoff et al. "Preparing for the Next Century: The State of Mechatronics Education", IEEE/ASME Transactions on Mechatronics, 2000. Imme (lead), Suzanne (2016 IS-GEO Summer Course), Victor, John Horel, Yolanda, Sai, Mary (inverse modeling), Suzanne (integrated modeling), Deana, Dan Fuka, Enrique, Hassan, Beth.

- Additional papers:
    - Possible paper for iEMSs focused on environmental modeling. Dan Fuka (lead), Yolanda, Suzanne.
    - paper on Lexithon exercise for AGU EOS Letters? -- we'll see tomorrow.

5:30 pm End

Optional: Group dinner

Thursday January 19:
Day 2 - Prioritizing Collaborative IS-GEO Research Challenges

8:00-8:30am Breakfast

8:30-9am Review of Day 1

9- 10:30am Navigating obstacles/challenges for interdisciplinary collaboration (Chair: Imme Ebert-Uphoff)

- Speaker: Deana Pennington
- Discussion
- *Prepare ahead of time: Relevant materials to contribute*

10:30-11 Break

11 - 12:30 IS-centered World Cafe II: Grand challenges (Chair: Mariana Guereque)

- Identify grand challenges and promising research directions of interest to participants
- Leads same as Day 1, changes as needed by people arriving/departing
    - Model-driven sensing
    - Knowledge maps
    - Theory-guided learning
    - Trusted threads
    - Interactive analytics
- *Prepare ahead of time: Leads propose topics to discuss at each table*

12:30 - 1:30 Lunch (provided) and Birds of a Feather discussions

1:30-3pm GEO-centered World Cafe II: Grand challenges (Chair: Katie Skinner**)**

- Identify grand challenges and promising research directions of interest to participants
- Leads same as Day 1, changes as needed by people arriving/departing
    - Atmospheric
    - Ocean
    - Polar
    - Geospace
    - Earth sciences
        - Near surface
        - Deep subsurface (geophysics)
- *Prepare ahead of time: Leads propose topics to discuss at each table*

3-3:30pm Break

3:30-3:45 Lexithon session II (Chair: Daniel Garijo, Michael Christoffersen)

- Review terms from Day 1
- Discuss terms to add based on the discussions of Day 2
- Paired discussion activity about a selected set of terms
- Final review and planning next steps

3:45-4:30 Collaboration (Imme Ebert-Uphoff)
Presentation

4:15- 5:00 pm World Cafe Report Out and Summary Discussion (All Topic Leaders)

Optional: Group dinner

Friday January 19:
Day 3 - Planning Next Steps to Pursue Research Collaborations

8:00-8:30am Breakfast

8:30-9am Review of Day 2

9-10:30 am Threading Themes (Chair: Victor Pankratius)

- Topics:
    a. Sensor-based data Collection & Integration, possible application for early warning systems
        - From IS: Craig K., Beth, Daniel G., Samet, Emre
        - From GEO: Mariana G., Enrique Cabral-Cano, Suzanne, Craig K. Jie Li, Daniel Fuka

b. Geoscience Case Studies, Benchmarks, Feature Detection / Discovery: Data with a story that includes question and validation as GEO-driven case studies for IS researchers
    - From IS: Victor Pankratius, Sai Ravela, Emre, Imme
    - From GEO: Mariana G.
c. Geo-Simulations (parametrizations, scales, integration of different models, etc.)
    - From IS: Jie Li, Sai Ravela, Katie Skinner, David R. Thompson, Emre, Yolanda G.
    - From GEO: Suzanne

- Goals of this session:
    - Each group discusses common topics of interest and defines one or more of these based on individual's interest:
        - Short term prototyping efforts
        - Mid-term proposal-size activities
        - Long-term driving vision
    - Each group should consider setting up an IS-GEO Working Group:
        - Identify lead(s)
        - Report to the larger group
        - Prepare a brief description to publicise on IS-GEO web site
        - Set up group telecons/webinars and involve students and others signed up to IS-GEO

10:30 - 11:00 Break

11:00 am - 12:30 pm Education (Chair: Imme Ebert-Uphoff)

- Presentations on courses/materials that people currently have
    - Suzanne Pierce and Enrique Cabral on 2016 IS-GEO Summer School
    - Padhraic Smyth on UCI NRT
    - Victor Pankratius
    - Sai Ravela
    - Yolanda Gil on "Data Science for Non-Programmers" course
- DIscussion on what is needed that we don't currently have
- Identify next steps and possible activities for the group
- *Prepare ahead of time: Participants propose presentations based on their course offerings and materials, needs, ideas,...*

12:30 pm Closing, Box lunches available

Optional for participants staying for the afternoon:
Lexithon activity, TACC Tours, paper writing, planning, hiking...