Spatial Computing 2020
Agenda for August 24th Conference Call

- Q? How to organize breakouts and synthesis reports towards an effective report?
  - Breakout themes
  - Breakout leaders
  - Breakout Discussion Questions
- Q? Dinner speaker(s)

Mapping Workshop Activities & Proposal to Report Outline

Recent Grand Challenges Discussions

- 2009 NSF Workshop (P. Agouris)
- 2010 AAG Panel
- 2010 Goodchild Paper

Proposal

1. Introduction
2. …

Workshop Activities – Day 1

Opening Remarks, Current Initiatives

Pull Panel: National Priorities, Societal Applications of Spatial Computing (SC)

Break – Identify cross-cutting SC application characteristics

Breakout: on new SC research opportunities from application trends

Lunch, Breakout Report Back

Push Panel: SC Platform Trends, Disruptive Technologies

Break

Breakouts on new SC research opportunities from platform trends

Report back

Report Outline, Writing Assignments

Report Outline

1. Introduction
1.0 Why Spatial Computing?
1.1 Challenges
1.2 Opportunities
2. Research Directions
2.1 SC Sciences
2.2 SC Systems
2.3 SC Services
2.4 Cross-Cutting
3. Closing
4. About This Document

A: Emerging Application Attributes

A.1 Example Applications

A.2 Attributes of Applications

B. Emerging Platform Trends

Components of Spatial Computing (SC)

- Each breakout session will have three to four groups.
  - via SC components of sciences, systems, services & cross-cutting
- SC Sciences
  - Conceptual and Mathematical Models, e.g., Topology, Geometry, Graphs, Vector Spaces (e.g., Metric, Euclidean), Spatial Pictogram enhanced UML/ERD,
  - Spatial Cognition (AI)
  - Spatial Data-Structures & Algorithms: Computational Geometry
  - Data Analytics: Spatial Statistics, Spatial Data Mining, …
- SC Systems
  - Data Collection: Sensors, Digitizers, Geo-registration, …
  - Spatial Database Management: Spatial Indexes (e.g., R-tree), Spatial Query Languages (e.g., map algebra, OGIS), Spatial Query Processing and Optimization, …
  - Presentation, e.g., cartography, geo-visualization, …
  - User Interaction, e.g., mouse, pen, …
- SC Services
  - Virtual Globes, e.g., Google Earth/Map, …
  - Location Based Services, e.g., Routing, Nearest Facility, Geo-coding ,Geo-fencing, …
  - Geo-social media, e.g., check-in, Ushahidi, …
- Cross-Cutting

Platform Trends and Impact on SC Components

- Platform Trends (Push)
  - Interaction: Mouse → Touch-screens, Gesture (e.g., MS Kinnect)
  - Presentation: Visual → Multi-modal including sound, …
  - Client device: Personal Computer → Tablets, Smart-Phones, …
  - Server devices: Large Computers → Cloud Computing
  - Internet: world-wide-web → social media
  - Sensor Platforms: Satellites, Airplanes → UAV, Smart-phones, wearable, …
  - Sensor Types: 2D imagery → 3D (e.g., LiDAR); richer phenomenology
  - Location of Internet Entities: GPS-based → Geodetic Infra-structure Based
- Panel or a set of short presentations
  - To illustrate some of the trends, e.g.,
- Breakouts across SC Sciences, Systems, Services, Cross-Cutting
  - Which platform trends are most disruptive?
  - Which assumptions of current SC sciences, systems and services are violated?
  - What new SC science, system and service research opportunities do they present?
  - Which represent most compelling cases for new spatial computing research initiatives in terms of societal benefits and national priorities?

Trends in Applications and National Priorities

- Application & National Priorities Trends (Pull)
  - National Priorities: Environment → Energy (Smart Grids), Security, Healthcare, Economy, Education, Transportation, … see 8 big data reports, July 8th Grand Challenges meeting report, ... (0.5 page per priority in Appendix) – Day 1 AM
  - Application Characteristics (Cross-cutting across multiple national priorities) identified by a small group of workshop leader over lunch to be shared after lunch before breakout
    - Space: Geo-Spatial → Spatio-temporal
    - Setting: Open Natural Spaces → Urban, Indoors, Inside living organism
    - Spatial Collaborations: Local → World-wide (e.g., Climate Change)
    - Spatial Data Quality (e.g., Uncertainty): Implicit → Explicit
    - Surveillance: Sporadic → Persistent
    - Location Privacy, Confidentiality & Security: Secure Premises → Open Places
- Panel or a set of short presentations
  - To illustrate the trends within ongoing/future initiatives at NIH, DOD, …
- Breakouts across SC Sciences, Systems, Services, Cross-Cutting 3 Ss, …
  - Which assumptions of current SC sciences, systems and services are violated?
  - What new SC science, system and service research opportunities do they present?
  - Which present most compelling case for new spatial computing research initiatives in terms of societal benefits and national priorities?

Agenda: Day 1 – Choice 1 (Push before Pull)

Time	Activity	Details
830am- 9am	Opening Remarks, Current Initiatives	Organizers, NSF
9am – 1030am	Push Panel: SC Platform Trends, Disruptive Technologies	Overview of Platform Trends, 5 talks on trends in interaction, presentation, client, server, Internet, …
1030am-11am	Break – Identify cross-cutting SC application characteristics	
11am- 12noon	Breakouts on new SC research opportunities from platform trends	4 groups: science, systems, service, cross-cutting
12noon-1pm	Lunch	
1pm-130pm	Breakout Report Back	4 groups * 5 minutes each + Q/A
130pm – 3pm	Pull Panel: National Priorities, Societal Applications of Spatial Computing (SC)	National Priorities overview (Kalil?) + 5 talks e.g., DOD, DOE, DHS, NIH, NOAA, NSF Earthcube, etc.
3pm-330pm	Break	
330pm-5pm	Breakout: on new SC research opportunities from application trends	4 groups: science, systems, service, cross-cutting
5pm – 530pm	Report back	4 groups * 5 minutes each + Q/A
530pm – 6pm	Report Outline, Writing Assignments	
615pm	Dinner – place tbd	Dinner – place tbd

Agenda: Day 2

Time	Activity	
830am- 9am	Plan for the Day	
9am – 1030am	Present 1st Draft	Peer Review
1030am-11am	Break	
11am- 12noon	Refine draft based on peer review	
12noon-145pm	Lunch & Presentation of Revised Draft	
145pm – 2pm	Wrap Up, Post workshop assignments	

Q? Is it possible to assemble a draft report before start of Day 2 for comments And revision by the group on Day 2?