DATA 03 Object Reuse and Exchange; Studies of scientific collaboration.

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Overview
The work briefly presented here reports on two parallel and interrelated research endeavors, which are now concluded. The first endeavor involves the design and development of tools to allow efficient reuse and exchange of information objects resulting from embedded sensor network research applications. The second endeavor stems directly from the dissertation research of the project’s PI and deals with the study of scientific collaboration networks at the Center for Embedded Networked Sensing.

Approach
The Object Reuse and Exchange portion of this project builds on previous research in which we developed a conceptual model of the CENS scientific lifecycle (Figure 1). This research has revealed that production of environmental sensing data involves continuous handling of heterogeneous types of information at various stages of a data life cycle.

The study of CENS scientific collaboration was developed from 2006 to 2010 and was reported in an unpublished dissertation and forthcoming publications. By use of survey research and network analysis, this part of the project examined the collaborative ecology of CENS in terms of three networks of interaction: co-authorship of scholarly papers, communication activity on mailing lists, and interpersonal acquaintanceship.

System Description
As part of the Object Reuse and Exchange project, we identified three major digital resources across the CENS data life cycle: a) information about deployments, b) sensor data and c) scientific publications. In published work, we adapted the OAI-ORE data model to describe, publish and share aggregations of information objects produced at different stages of the CENS scientific lifecycle and across the three aforementioned digital repositories. In submitted work, we proposed the use of microblogging to document field-based research and the linkages that exist between deployment information and related scientific artifacts.

The study of scientific collaboration exposes the topology, structure, and evolution of CENS networks in relation with the disciplinary and institutional arrangements of the center. Findings of this research point to the importance of interpersonal relationships for accomplishing scientific work in distributed environments. Network analyses reveal that structural communities in the co-authorship and acquaintanceship networks overlap considerably. The community structure of the acquaintanceship network is shown in Figure 2.

Accomplishments
The accomplishments for the reporting period are limited to the editing, preparation, and submission of the scholarly papers related to this research project (currently in submission).

Future Directions
This project is discontinued as of June 30, 2010.