**Collaborative Project:**

**Flexible and Personalized Information-Seeking Interfaces for Learners and Educators in the NSDL**

(A joint collaboration of Virginia Tech, Villanova, and the University of Puerto Rico, Mayaguez Campus)

This project responds to NSF 03-530 and addresses the ‘targeted research projects’ theme of the solicitation. The goal of the proposed project is to investigate how flexible and personalized information-seeking interfaces can be created, in order to customize interactions for educators and learners in the NSDL. To realize the NSDL vision of an effective networked environment for scientific and technological education with ‘anytime, anywhere’ access to context and services, we argue that digital library interfaces must integrate a flexible mode of information-seeking, providing support for both exploratory and focused interaction, with the ability to invoke and compose context-sensitive services at various levels of the interaction. To provide this functionality seamlessly in the existing NSDL infrastructure and prevailing usage contexts we propose a research agenda involving:

1. Novel interaction instruments;
2. Composition of context-sensitive services;
3. Multiple devices, many locations; and

The project is a joint collaborative effort of Virginia Tech (PIs: Naren Ramakrishnan, Manuel A. Pérez-Quinones, and Edward A. Fox), Villanova University (PI: Lillian Cassel), and the University of Puerto Rico (PI: Bienvenido Vélez-Rivera). The team brings a broad background and proven expertise in all of the areas targeted in this proposal, and will apply this expertise toward our stated vision of NSDL usage. We will leverage emerging digital library standards (OAI, OpenURL) as well as our own research in personalization and digital libraries (the PIPE methodology for information personalization, the 5S framework for digital libraries, the WebContext system for remote access to shared context) to provide a roadmap to achieving flexible and personalized functionality in NSDL. One of the primary digital library testbeds for our research will be CITIDEL (the Computing and Information Technology Interactive Digital Educational Library, part of the collections track in NSDL).

**Intellectual Merits:** The research results will dramatically enhance our understanding of how personalized information-seeking interfaces can be constructed, and allow us to identify ways by which information access to digital libraries should be customized. The emphasis on portable context will aid us in investigating multi-platform interfaces in the NSDL context and provide design guidelines on how to create such interfaces. While significant design expertise is available for web technologies and voice-based interfaces, research in multi-platform interfaces has lagged behind; our project takes important steps toward addressing this void. Finally, by studying specific technological ideas in concrete education contexts, the project helps develop guidelines on how personalization technologies can usefully impact educational usage.

**Broader Impacts:** The team is committed to the larger dissemination of the results and methodologies developed in this project. For educators, the personalized information-seeking interfaces developed here will be of direct benefit in improving course delivery, increasing automation, and enhancing information access. For learners, the project offers them the capabilities to find the resources and services they value, and makes NSDL sites more responsive to their needs. The operation of this project itself entails broadening aspects, such as increasing the participation of minority students and encouraging a wider use of existing NSDL resources such as CITIDEL.