



National Science Foundation (NSF) Research Experience for Undergraduates (REU) Program

MedIX Site: Medical Informatics
DePaul University & Northwestern University

June 12th –August 18th, 2006

MedIX: Medical Informatics eXperiences in undergraduate research

Goals:

- promote the possibility of graduate studies for bright, talented undergraduates
- promote and encourage *interdisciplinary studies in Computer Science and Medical Informatics* to undergraduate students



Benefits of doing research at the undergraduate level:

- *participation as part of a team*
 - teams of two undergraduate students and one faculty mentor



Summer 2005: REU Participants

Benefits of doing research at the undergraduate level:

- *participation as part of a team*
 - work performed in research labs:
 - CTI Intelligent Multimedia Processing (IMP) lab
 - CTI Medical Imaging (MI) lab
 - Northwestern Imaging Informatics Center

The screenshot shows the website for the Intelligent Multimedia Processing Laboratory. The header includes the IMP logo and the DePaul University logo. The main content area is titled "Intelligent Multimedia Processing Laboratory" and contains sections for "IMP Mission", "IMP Research Interests", and "IMP Collaborators & Funding Agencies". The "IMP Mission" section states: "The Intelligent Multimedia Processing Laboratory's (IMP Lab) mission is focused on medical imaging, image processing, computer vision, content-based multimedia retrieval, and data mining. Our goal is to develop both the theory and the tools for real world applications from various domains, such as medicine, homeland security, intellectual property, and business intelligence domain." The "IMP Research Interests" section lists "Medical Imaging", "Intellectual Property", and "Bioinformatics". The "IMP Collaborators & Funding Agencies" section lists "National Science Foundation (NSF) - Research Experiences for Undergraduates (REU)". A sidebar on the left contains navigation links: Home, News, Research, Publications, IMP Faculty, IMP Students, Matlab Tutorials, Courses, Useful Links, and Contact Us.

on the projects

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We also provide [research imaging services](#) to the community.

g needs of the faculty radiologists, their staff and the desktop computer and network support. We also have internal and external Web servers, and research [DICOM](#)

informatics research laboratory. The laboratory is a 4000 square foot facility, fully equipped for imaging informatics research. We operate a large UNIX server as well as several Windows 2000 and Windows NT servers. We also operate two PACS test environments that emulate the c

Benefits of doing research at the undergraduate level:

- *active involvement with faculty mentors*

- three computer science faculty mentors (two females) and one medical doctor mentor
- weekly meetings with the mentor
- mentor availabilities:

Monday: Dr. Furst, Tuesday: Dr. Raicu, Wednesday: Dr. Dettori,
Thursday: Dr. Channin, Friday: all mentors

Benefits of doing research at the undergraduate level:

- *participation in current and interdisciplinary research*

MedIX Projects for Summer 2006:

- *Visualization techniques for medical data*
- *Volumetric segmentation*
- *Content-based medical image retrieval systems*
- *Machine learning approaches for texture-based segmentation*
- *Automatic detection of intensity spots in micro-array images*
- *Ontology development*
- *Accelerating visualization techniques*
- *User interface development*
- *Evaluation of segmentation algorithms*
- *Texture classification algorithms testing*

Benefits of doing research at the undergraduate level:

- *presentation, dissemination of results, rewards of publishing and attending conferences*
 - Internal presentations:
 - Presentations at the Visual Computing Seminar (each Friday)
 - Mid-Program and Final program Presentations (July 11th and August 15th)
 - External presentations:
 - Conferences in the medical imaging field
 - Research Publications
 - Conferences, journals
 - **Summer 2005: 6 research papers**



Research Publications

- **Semler, L. & Dett** Computed Tomog Atlanta, GA, USA.
- **L. Semler, L. Dett** *Texture Classifica Conference on C*
- **N.J. Backman, B.** *adaptive approach descriptors*", *Proc* 2006.
- **S. Handrick, B. N** *Evaluation for Tiss Proceedings of SF* 2006.
- **B.W. Whitney, N.** *segmentation of a Proceedings of SF* 2006.
- **R. Lerman, D.S. Raicu, J.D. Furst**, "Contrast enhancement of soft-tissues in Computed Tomography images", *Proceedings of SPIE Medical Imaging Conference*, San Diego, CA, February 2006.

The screenshot shows the SPIE Medical Imaging website. At the top, there is a navigation bar with links: SPIE HOME, MEDICAL IMAGING, SUBMIT AN ABSTRACT, REGISTER, CONFERENCES, EXHIBITION, SHORT COURSES, SPECIAL EVENTS, TRAVEL/GENERAL, PAST PROGRAM, and CHAIR INFO. Below this, there is a 'DETAILS' section with links for 'Invitation to Participate', 'Printed Call for Papers (2.4 MB PDF)', and 'Letters of Invitation for Visa Process'. The main content area is titled 'Medical Imaging CALL FOR PAPERS' and includes the SPIE logo, the conference dates '17-22 February 2007', and the location 'Town and Country Hotel San Diego, California USA'. There is also a list of topics for 'Inviting papers on:' such as 'Physics of Medical Imaging', 'Image Processing', 'Computer-Aided Diagnosis', etc. On the right side, there are sections for 'IMPORTANT DATES' (Conference Dates: 17-22 February 2007, Abstract Due Date: 7 August 2006, Manuscript Due: 22 January 2007), 'SPONSORED BY' (SPIE - The International Society for Optical Engineering), and 'COOPERATING' organizations like AAPM, APS, CARS, and IS&T.

Benefits of doing research at the undergraduate level:

- *great source of recommendation letters for graduate school*
- *glimpse into the life of a graduate student*

Activities of the REU Program (Summer 2006):

<http://facweb.cs.depaul.edu/research/vc/medix/2006/index.htm>