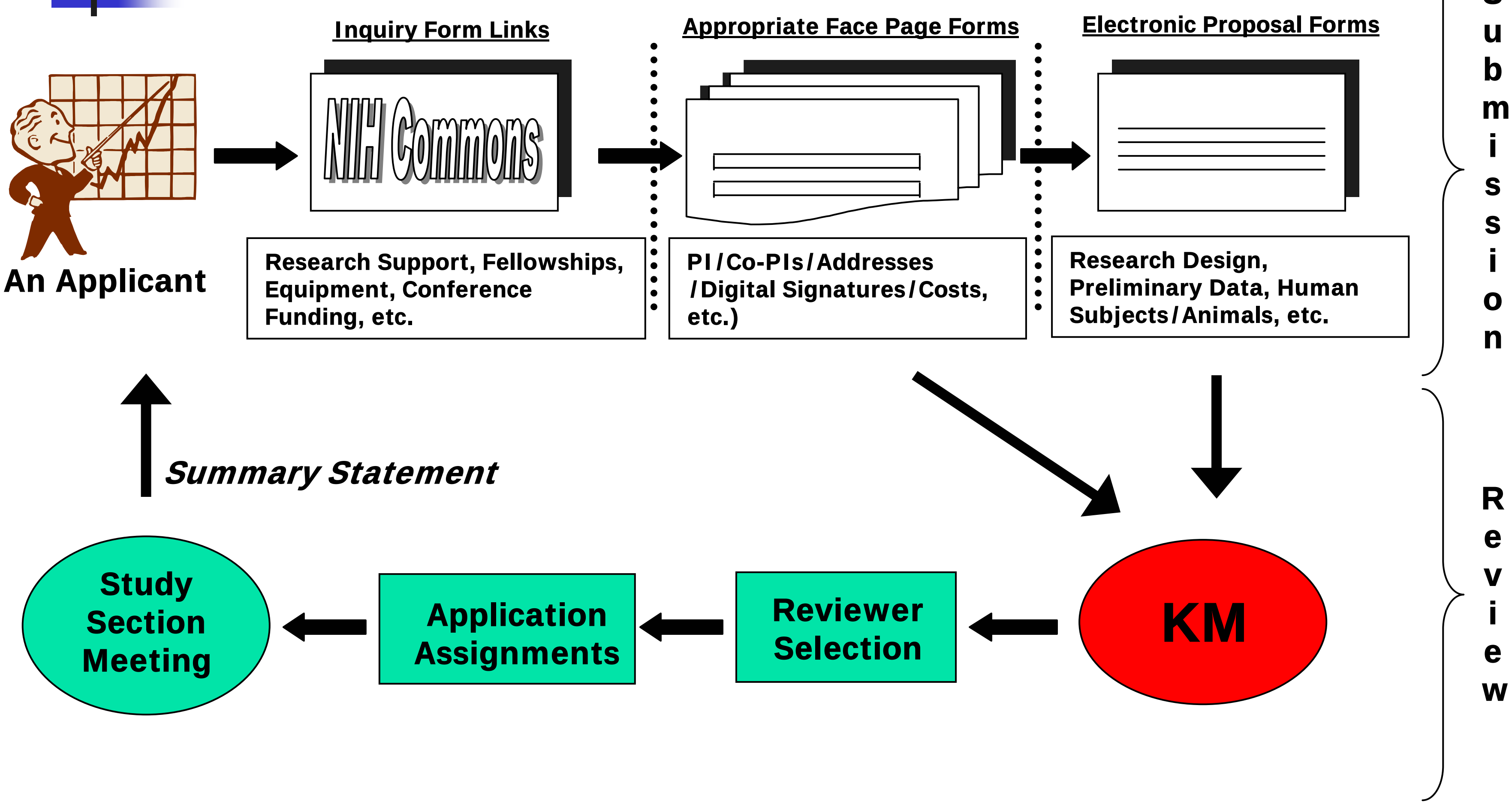
The NIH Electronic Application Submission/Review



SRA Responsibilities

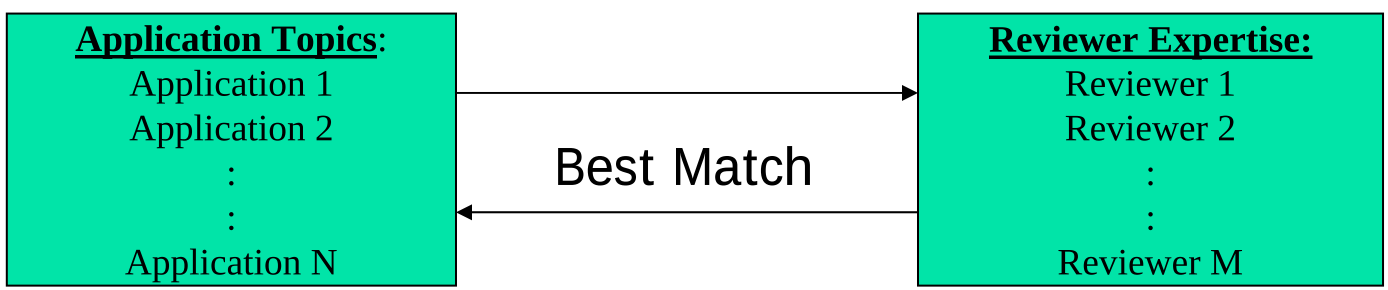
TWO MAIN FUNCTIONS OF AN SRA:

- Finding reviewers with appropriate expertise that matches best with application areas at a given Study Section
- Making reviewer/application assignments so that:

  a) all application are adequately covered

  b) number of required reviewers at the meeting is minimized

  c) number of assignments per reviewer is balanced



Information Resources

Databases:

PubMED → MeSH Thesaurus

CRISP → CRISP keyword sets

www.nlm.nih.gov/mesh

crisp.cit.nih.gov

Keyword Domains

MeSH Tree Branch for Diagnostic Imaging:

- Diagnostic Imaging [E01.370.350]
  - Image Interpretation, Computer-Assisted [E01.370.350.350] +
  - Imaging, Three-Dimensional [E01.370.350.400] +
  - Magnetic Resonance Imaging [E01.370.350.500] +
  - Microscopy, Electron [E01.370.350.510] +
  - Photography [E01.370.350.600] +
  - Radiography [E01.370.350.700] +
  - Radionuclide Imaging [E01.370.350.710] +
  - Spectroscopy, Near-Infrared [E01.370.350.750]
  - Subtraction Technique [E01.370.350.760] +
  - Thermography [E01.370.350.800]
  - Tomography [E01.370.350.825] +
  - Transillumination [E01.370.350.840]
  - Ultrasonography [E01.370.350.850] +

CRISP Bioimaging keywords:

13229 – bioimaging/biomedical imaging

13230 – cardiovascular imaging

13231 – angiography

13232 – angiocardiography

…

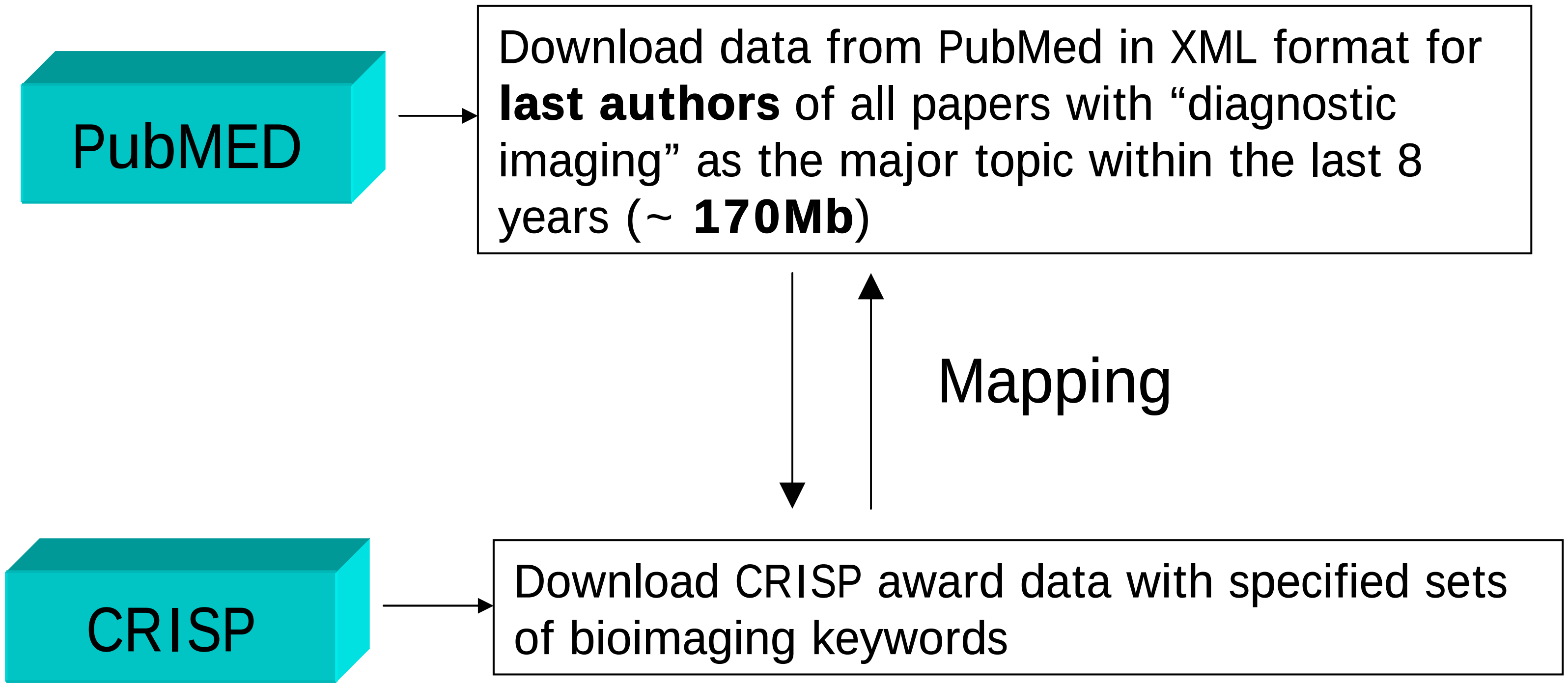
13349 – ultrasonography

13350 – angiocardioultrasonography

13351 – heart sonography

13352 – ultrasound blood flow …

Downloading Reviewer Data



The Program Shell

```
-------------------------------------------------------------------------------
Please choose one of the following options:
[1] Create Database from PubMed XML file.      [2] Load CRISP files.
[3] Load Current Database   [4] Save Database (overwrites previous)
[5] Re-map MESH and CRISP keywords      [6] Generate individual HTML pages
[7] Load XML/CRISP/Map/Generate HTML [8] Search Help     [9] Quit the Program
[10] Perform Assignments [11] Enter Reviewer filename    [12] Add Reviewers
[13] Assignments Minimization

--> There are 17203 people in the loaded database.
    964 of them have at least one CRISP record.
-------------------------------------------------------------------------------
>
```

Reviewer Search in the Downloaded Database

Tags used for extracting info:

[First:First Name] [Last:Last Name] [Initials:Initials]

[Affiliation: Affiliation String] [Mapped: Mapped Terms]

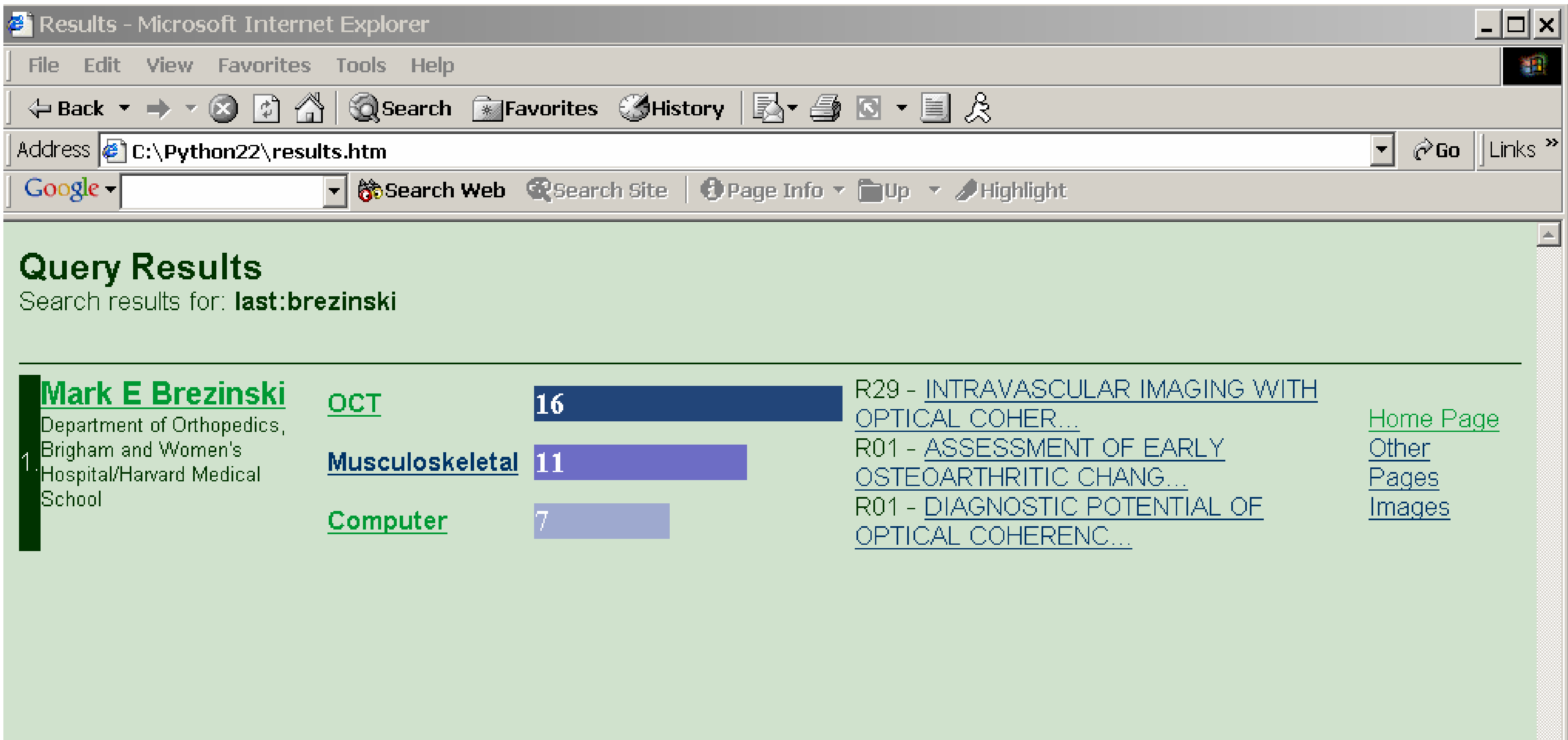
[MESH: MESH and CRISP terms [CRISP:yes/no] [Text: Abstracts and Titles]

The default search tag is ‘Mapped', and all terms are and-ed together.

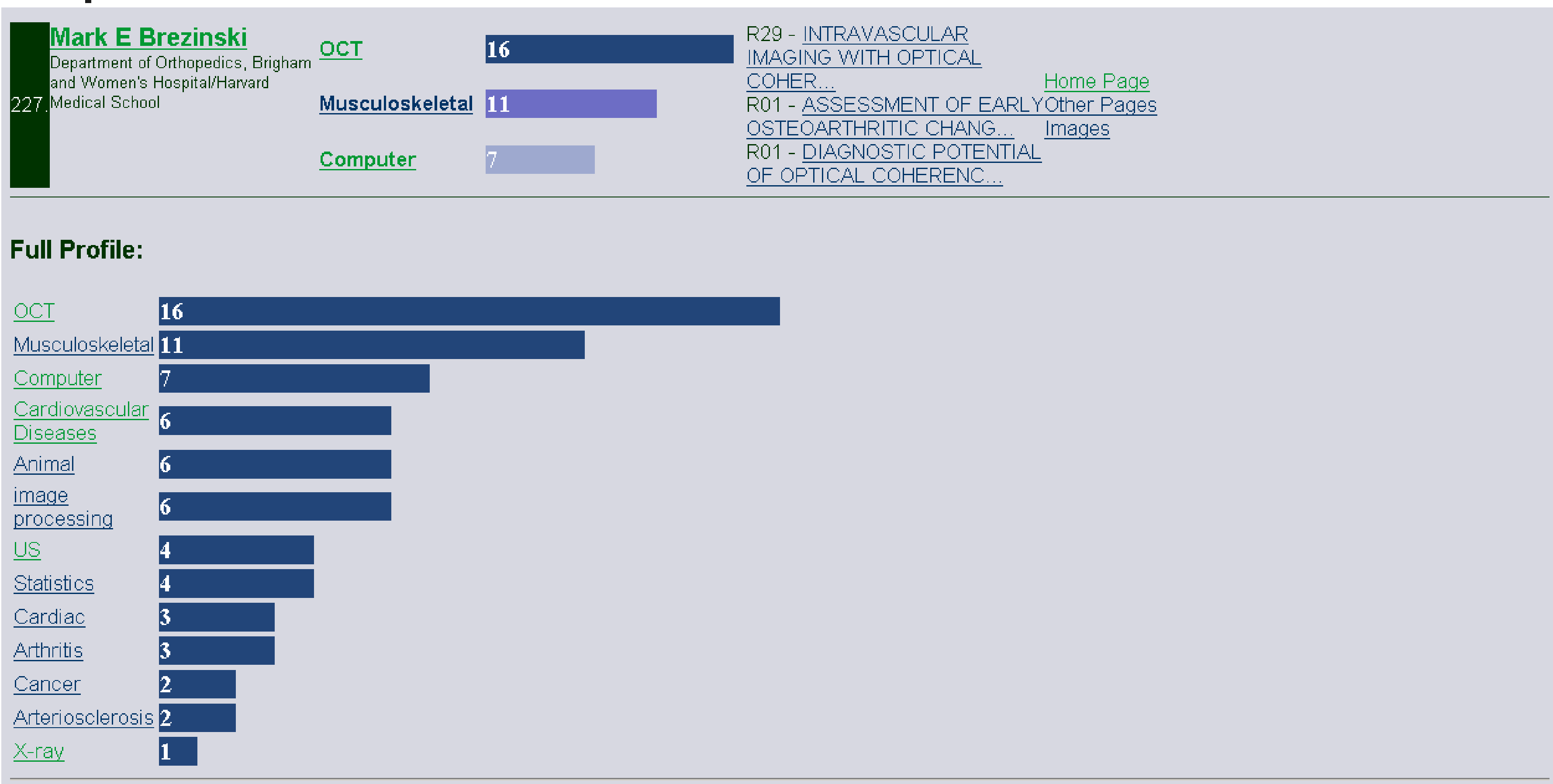
Mapped and MESH tags can have multiple strings separated by 'and'

and Text searches can have multiple searches separated by 'or'.

Reviewer Brief Profile Page



Reviewer Full Profile Page



Reviewer Full Profile Page/CRISP data

Crisp Info:

Awards

R29 - INTRAVASCULAR IMAGING WITH OPTICAL COHERENCE TOMOGRAPHY

R01 - ASSESSMENT OF EARLY OSTEOARTHRITIC CHANGES WITH OCT

R01 - DIAGNOSTIC POTENTIAL OF OPTICAL COHERENCE TOMOGRAPHY FOR

R01 - New Model for Assessing Cartilage Repair and Protection

R01 - Optical Coherence Tomography for Pulmonary Circulation

R01 - IMPROVING THE DIAGNOSTIC POTENTIAL OF OCT FOR VULNERABLE

R01 - Optical Coherence Tomography for Microsurgical Guidance

Email: mebrezin@mit.edu

Title: PROFESSOR

Reviewer Full Profile Page/Publications MeSH Keyword List

Mesh Keyword List:

methods [30]
pathology [25]
Tomography [16]
radiography [15]
Support, U.S. Gov't, P.H.S. [12]
Support, Non-U.S. Gov't [9]
Human [8]
Support, U.S. Gov't, Non-P.H.S. [8]
Optics [7]
Animal [6]
Image Processing, Computer-Assisted [6]
instrumentation [4]
Cartilage, Articular [3]
Rabbits [3]
ultrasonography [3]
Ultrasonography, Interventional [3]
Osteoarthritis [3]
anatomy & histology [2]
Knee Joint [2]
Coronary Arteriosclerosis [2]

Reviewer Full Profile Page/Paper Abstracts

MEDLINE Article Abstracts:

Cartilage thickness measurements from optical coherence tomography.

By: Mark E Brezinski (ME)
from: Department of Orthopedics, Brigham and Women's Hospital/Harvard Medical School, 75 Francis Street, Boston, Massachusetts 02115, USA.
published in:J Opt Soc Am A Opt Image Sci Vis

We describe a new semiautomatic image processing method for detecting the cartilage boundaries in optical coherence tomography (OCT). In particular, we focus on rabbit cartilage since this is an important animal model for testing both chondroprotective agents and cartilage repair techniques. The novel boundary-detection system presented here consists of (1) an adaptive filtering technique for image enhancement and speckle reduction, (2) edge detection, and (3) edge linking by graph searching. The procedure requires several steps and can be automated. The quantitative measurements of cartilage thickness on OCT images correlated well with measurements from histology.

Characterizing arterial plaque with optical coherence tomography.

By: Mark Brezinski (M)
from: Department of Orthopedic Surgery, Brigham and Women's Hospital, Boston, MA, USA. mebrezin@mit.edu
published in: Curr Opin Cardiol

Many imaging technologies have been pivotal in the reduction of mortality associated with coronary artery disease over the last 50 years. However, there are several areas where coronary disease could benefit from high-resolution imaging. Recently, optical coherence tomography (OCT) has been introduced for micron scale intravascular imaging. OCT is analogous to ultrasonography, measuring the intensity of back-reflected infrared light rather than sound. First, its resolution, at 4 to 20 microm, is higher than that of any currently available imaging technology. Second, acquisition rates are near video speed. Third, unlike ultrasonography, OCT catheters consist of simple fiber optics and contain no transducers within their frame. This makes imaging catheters both inexpensive and small, the current smallest cross-sectional diameter being 0.014 inches. Fourth, OCT systems are compact and portable. Finally, it can be combined with a range of spectroscopic techniques. This article reviews the application of OCT to intracoronary imaging.

Reviewer Full Profile Page/CRISP Abstracts

Abstract

Back to Hit List

Grant Number: 5R29HL055686-02
PI Name: BREZINSKI, MARK E.
PI Email: mebrezin@mit.edu
PI Title: PROFESSOR
Project Title: INTRAVASCULAR IMAGING WITH OPTICAL COHERENCE TOMOGRAPHY

Abstract: *DESCRIPTION (Adapted from Applicant's Abstract): The goal of this research is to develop a new method of intravascular **imaging**, which has the possibility of identifying atherosclerotic lesions. The lesions would then be characterized as to their potential for progression to alteration or rupture. The possibility of identifying and discriminating those lesions which are at risk for rupture has great significance. The applicants proposed to use optical coherence tomography (OCT) to develop a high resolution intravascular **imaging** system for the diagnosis of atherosclerotic lesions. The applicants noted the analogy of OCT to B Mode **ultrasound imaging**. However, the use of infrared light rather than acoustical waves should provide high resolution, broad dynamic range, and easy integration into cardiovascular catheter systems. The principal focus of this application is the development of background feasibility experiments designed to assess the feasibility of this approach. These background experiments focus on identifying advantages and limitations of OCT for intravascular **imaging** and maximizing performance. The specific aims are: 1) To perform **imaging** on a wide range of plaque morphologies and vascular components; 2) To determine the limitations associated with **imaging** through whole blood; 3) To identify the optimal incident wavelength for OCT **imaging** of the vasculature; 4) To directly compare the ability of both OCT and high frequency **ultrasound** (IVUS) to assess micropathology within human atherosclerotic plague in virtu; and 5) To demonstrate the ability of OCT and IVUS to perform in vivo **imaging** of an intravascular stent within a rabbit aorta.*

Assignment Routine/Input Reviewer Info File

	A	B	C	D	E	F	G	H	I	J	K
1	**min**	**max**	**total max**	**on roster**	**Affiliations**	**Reviewer name**	**Areas**				
2	3	3	5	*	University of Illinois/Chicago	Keith Thulborn	MRI	MRS	fMRI	neuroimaging	
3	3	6	8	*	New York University	Glyn Johnson	MRI	perfusion	cardiac		
4	3	4	6	*	SUNY/Stony Brook	Helene Benveniste	MRI	diffusion	neuroimaging	modeling	
5	3	6	8	*	UNIVERSITY OF TEXAS HLTH SCI CTR HOUSTON	Ponnada NARAYANA	MRI	MRS	DTI	fMRI	MEG
6	3	6	8	*	MC LEAN HOSPITAL (BELMONT, MA)	Marc KAUFMAN	MRI	high-field MR	fMRI	MRS	animal
7	3	6	8	*	University of Arizona/Tuscon	DANZHOU YANG	MRI	MRS	molecular imaging	cancer	pharmacology
8	3	6	8	*	University of Texas/San Antonio	JIA-HONG GAO	MRI	DTI	MRS	whole body	
9	3	6	8	*	Columbia University	DIKOMA SHUNGU	MRI	MRS	whole body		
10	3	6	8	*	Carnegie Mellon University	CHIEN HO	MRI	high-field MR	MRS	animal	neuroimaging
11	3	6	8	*	OKLAHOMA MEDICAL RESEARCH FOUNDATION	ROBERT FLOYD	MRI	MRS	cardiac	animal	brain
12	3	6	8	*	Medical College of Wisconsin	SHI-JIANG LI	MRI	fMRI	small animal	cancer	
13	3	6	8	*	University of Minnesota	BRUCE HAMMER	MRI	high-field MR	microMR		
14	3	6	8	*	MRI Devices Corp.	George Duensing	MRI	fMRI	Coils		
15	3	6	8	*	University of California/San Francisco	David Saloner	MRI	cardiac	brain		
16	3	6	8	*	Columbia University	Sander Connolly	MRI	CT	neuroimaging		
17	3	5	7	*	University of Michigan	Neal Clinthorne	PET	PET	CT	SPECT	
18	3	5	7	*	JOHNS HOPKINS UNIVERSITY	DEAN WONG	PET	MRI	neurological	brain	pharmacology
19	3	6	8	*	Wake Forest University HSC	Kathryn Morton	PET	scintigraphy	fluorescence spectroscopy	MRS	
20	3	6	8	*	JOHNS HOPKINS UNIVERSITY	ALBERT LARDO	MRI	CT	animal	cardiac	
21	3	5	7	*	Mayo Clinic/Rochester	Stephen Riederer	MRI	cardiac	CT	physics	

Assignment Routine/Input Applications Info File

	A	B	C	D	E	F	G
1	**Affiliation**	**Appl. Title/PI**	**Areas**				
2	WASHINGTON UNIVERSITY	App. 1	CT	PET	lung	heart	brain
3	UNIVERSITY OF PENNSYLVANIA	App. 2	CT	PET			
4	BAYLOR COLLEGE OF MEDICINE	App. 3	MRI	coils	MRS	small animal	cardiac
5	DARTMOUTH COLLEGE	App. 4	MRI	coils	brain		
6	STANFORD UNIVERSITY	App. 5	MRI	high-field MR	animal		
7	UNIVERSITY OF CALIFORNIA SAN DIEGO	App. 6	MRI	MRS	fMRI	high-field MR	brain
8	UNIVERSITY OF CALIFORNIA SAN FRANCISCO	App. 7	MRI	MRS	DTI	high-field MR	bone
9	BOSTON UNIVERSITY MEDICAL CAMPUS	App. 8	MRI	MRS	fMRI	high-field MR	animal
10	UNIVERSITY OF PENNSYLVANIA	App. 9	MRI	MRS	fMRI	diffusion	perfusion
11	BRIGHAM AND WOMEN'S HOSPITAL	App. 10	MRI	CT	US	coils	neurosurgery
12	DREXEL UNIVERSITY	App. 11	MRI	fMRI	high-field MR	DTI	perfusion
13	UNIVERSITY OF CONNECTICUT STORRS	App. 12	MRI	fMRI	brain		
14	UNIVERSITY OF PITTSBURGH	App. 13	MRI	high-field MR	fMRI		
15	DUKE UNIVERSITY	App. 14	MRI	fMRI	brain		

…

Application $\longleftrightarrow$ Reviewer Optimization Function

$$Score\ Function\,(A_i, R_j) = C_1 \cdot w_1^{k_1} + C_2 \cdot w_2^{k_2} + \ldots + C_n \cdot w_n^{k_n}$$

$C_1, C_2, \ldots C_n, w_1, w_2, \ldots, w_n$ – *constants and weights to provide relative values for significance of application / reviewer expertise areas;*

$k_1, k_2, \ldots, k_n$ – *integers representing apprlication / reviewer expertise match occurrences.*

$\boxed{Score\ Function} \longrightarrow$ max, $\boxed{\begin{array}{c}\#\ of\ reviewers,\\ \#\ of\ assignments\ per\ reviewer\end{array}} \longrightarrow$ min

Assignment Optimization Results

Application	Assignments/Scores	Assignments/Reviewers
1	16 [50] 20 [25] 19 [25]	/ Neal Clinthorne/ Stephen Riederer/ ALBERT LARDO
2	16 [50] 20 [25] 19 [25]	/ Neal Clinthorne/ Stephen Riederer/ ALBERT LARDO
3	14 [31] 2 [25] 20 [31]	/ David Saloner/ Glyn Johnson/ Stephen Riederer
4	13 [37] 17 [31] 20 [25]	/ George Duensing/ DEAN WONG/ Stephen Riederer
5	9 [43] 19 [31] 12 [37]	/ CHIEN HO/ ALBERT LARDO/ BRUCE HAMMER
6	7 [43] 8 [43] 10 [43]	/ JIA-HONG GAO/ DIKOMA SHUNGU/ ROBERT FLOYD
7	6 [43] 7 [43] 10 [43]	/ DANZHOU YANG/ JIA-HONG GAO/ ROBERT FLOYD
8	5 [56] 9 [50] 10 [43]	/ Marc KAUFMAN/ CHIEN HO/ ROBERT FLOYD
9	3 [31] 2 [31] 10 [43]	/ Helene Benveniste/ Glyn Johnson/ ROBERT FLOYD
10	20 [37] 19 [37] 15 [37]	/ Stephen Riederer/ ALBERT LARDO/ Sander Connolly
11	3 [25] 2 [31] 4 [50]	/ Helene Benveniste/ Glyn Johnson/ Ponnada NARAYANA
12	5 [43] 3 [25] 17 [31]	/ Marc KAUFMAN/ Helene Benveniste/ DEAN WONG
13	5 [43] 12 [37] 9 [37]	/ Marc KAUFMAN/ BRUCE HAMMER/ CHIEN HO
14	13 [37] 15 [25] 5 [43]	/ George Duensing/ Sander Connolly/ Marc KAUFMAN
15	9 [50] 10 [43] 8 [37]	/ CHIEN HO/ ROBERT FLOYD/ DIKOMA SHUNGU
16	4 [56] 1 [43] 13 [43]	/ Ponnada NARAYANA/ Keith Thulborn/ George Duensing
17	6 [37] 15 [25] 12 [37]	/ DANZHOU YANG/ Sander Connolly/ BRUCE HAMMER
18	11 [37] 13 [37] 4 [43]	/ SHI-JIANG LI / George Duensing/ Ponnada NARAYANA
19	4 [43] 13 [37] 11 [37]	/ Ponnada NARAYANA/ George Duensing/ SHI-JIANG LI
20	13 [43] 11 [43] 5 [43]	/ George Duensing/ SHI-JIANG LI / Marc KAUFMAN
21	18 [25] 17 [31] 16 [62]	/ Kathryn Morton/ DEAN WONG/ Neal Clinthorne
22	9 [43] 12 [37] 20 [31]	/ CHIEN HO/ BRUCE HAMMER/ Stephen Riederer
23	9 [43] 14 [31] 12 [37]	/ CHIEN HO/ David Saloner/ BRUCE HAMMER
24	6 [37] 15 [25] 8 [37]	/ DANZHOU YANG/ Sander Connolly/ DIKOMA SHUNGU
25	5 [56] 4 [56] 10 [43]	/ Marc KAUFMAN/ Ponnada NARAYANA/ ROBERT FLOYD
26	8 [37] 1 [43] 6 [37]	/ DIKOMA SHUNGU/ Keith Thulborn/ DANZHOU YANG
27	16 [50] 18 [25] 17 [25]	/ Neal Clinthorne/ Kathryn Morton/ DEAN WONG
28	12 [37] 9 [37] 7 [31]	/ BRUCE HAMMER/ CHIEN HO/ JIA-HONG GAO
29	16 [50] 18 [25] 17 [25]	/ Neal Clinthorne/ Kathryn Morton/ DEAN WONG
30	4 [50] 5 [43] 13 [37]	/ Ponnada NARAYANA/ Marc KAUFMAN/ George Duensing
31	4 [62] 10 [50] 7 [43]	/ Ponnada NARAYANA/ ROBERT FLOYD/ JIA-HONG GAO

Assignments Output Tally

Reviewer	# Total	# Primary	Assignments							
Keith Thulborn	3	3	16[2]	26[2]	37[1]					
Glyn Johnson	3	3	3[2]	9[2]	11[2]					
Helene Benveniste	3	3	9[1]	11[1]	12[2]					
Ponnada NARAYANA	8	6	11[3]	16[1]	18[3]	19[1]	25[2]	30[1]	31[1]	32[2]
Marc KAUFMAN	8	6	8[1]	12[1]	13[1]	14[3]	20[3]	25[1]	30[2]	32[1]
DANZHOU YANG	8	6	7[1]	17[1]	24[1]	26[3]	33[2]	35[1]	36[1]	38[3]
JIA-HONG GAO	6	3	6[1]	7[2]	28[3]	31[3]	35[3]	37[2]		
DIKOMA SHUNGU	7	4	6[2]	15[3]	24[3]	26[1]	33[1]	37[3]	38[1]	
CHIEN HO	8	6	5[1]	8[2]	13[3]	15[1]	22[1]	23[1]	28[2]	36[3]
ROBERT FLOYD	8	3	6[3]	7[3]	8[3]	9[3]	15[2]	25[3]	31[2]	35[2]
SHI-JIANG LI	4	3	18[1]	19[3]	20[2]	36[2]				
BRUCE HAMMER	6	3	5[3]	13[2]	17[3]	22[2]	23[3]	28[1]		
George Duensing	8	5	4[1]	14[1]	16[3]	18[2]	19[2]	20[1]	30[3]	32[3]
David Saloner	3	3	3[1]	23[2]	34[1]					
Sander Connolly	4	3	10[3]	14[2]	17[2]	24[2]				
Neal Clinthorne	5	4	1[1]	2[1]	21[3]	27[1]	29[1]			
DEAN WONG	7	3	4[2]	12[3]	21[2]	27[3]	29[3]	33[3]	38[2]	
Kathryn Morton	3	3	21[1]	27[2]	29[2]					
ALBERT LARDO	5	3	1[3]	2[3]	5[2]	10[2]	34[2]			
Stephen Riederer	7	3	1[2]	2[2]	3[3]	4[3]	10[1]	22[3]	34[3]	