



MEDSQUARE

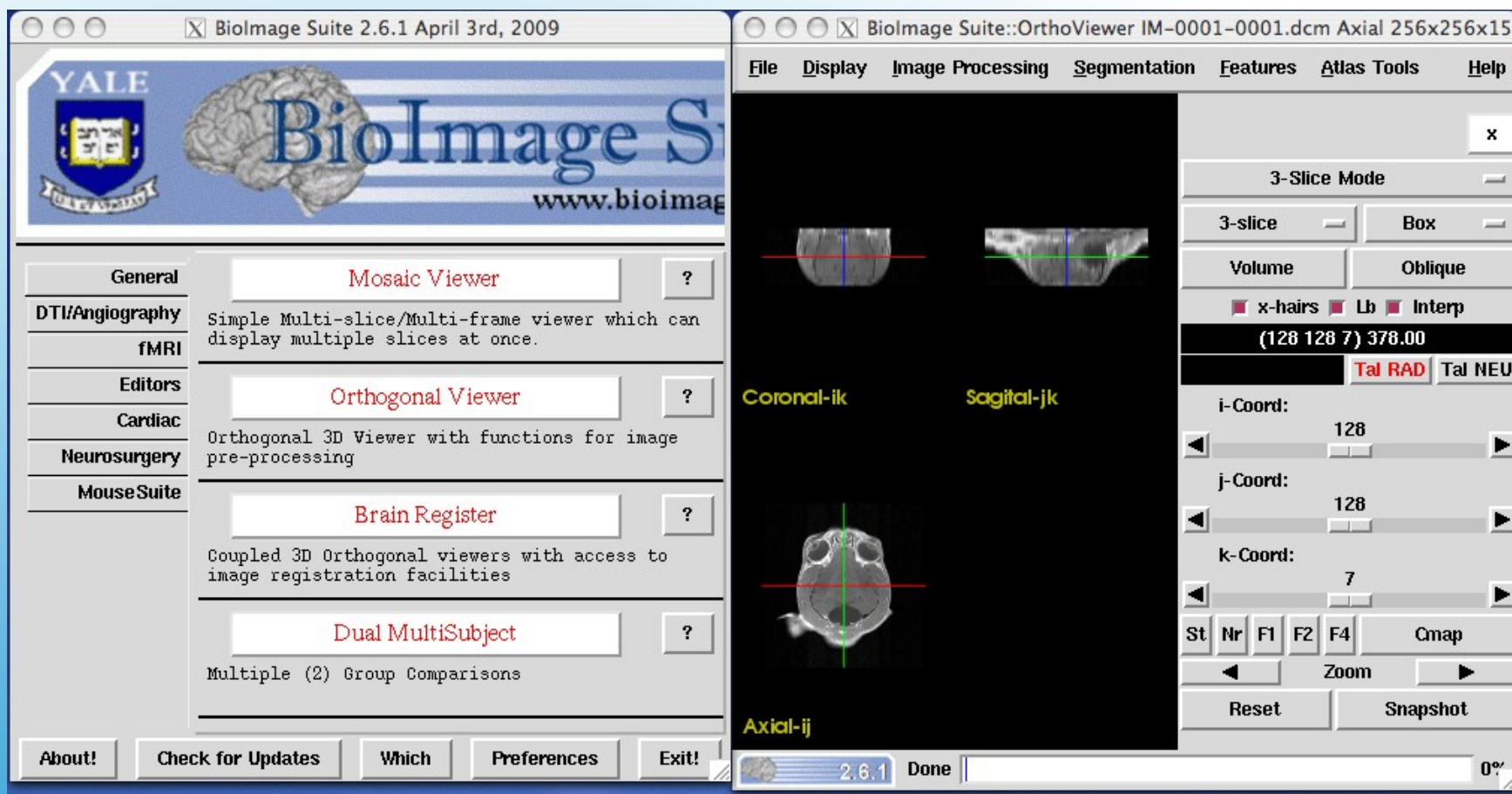
Plataforma modular para exploração
de imagens tomográficas

Marcos Bonci Cavalca

Orientador:

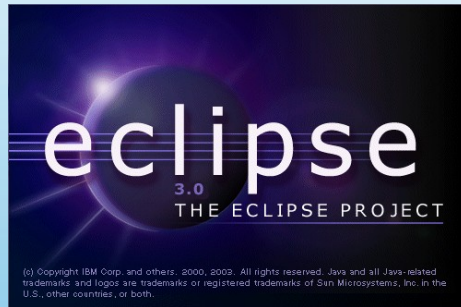
Prof. Marcel Parolin Jackowski

A saga, parte 1: nova interface para o BioImage Suite

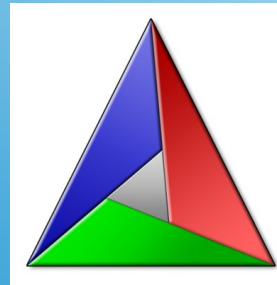
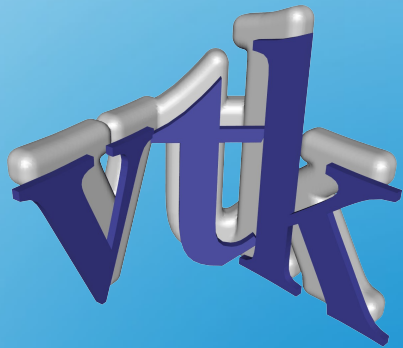
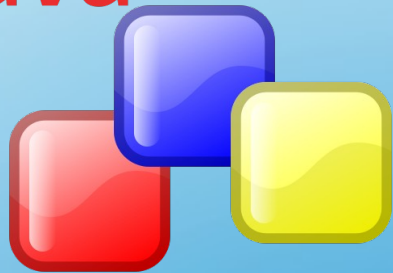


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MedSquare: Plataforma modular para exploração de imagens tomográficas

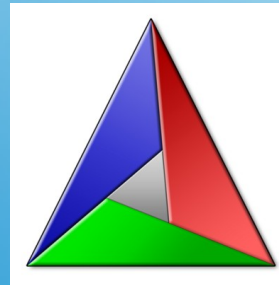
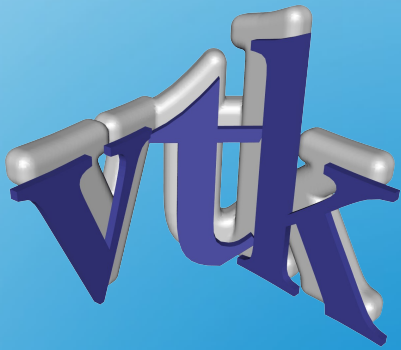
Tecnologias: familiarização e pesquisa



Code less.
Create more.
Deploy everywhere.



Tecnologias: familiarização e pesquisa



A saga, parte 2: Idéias com o Wiimote



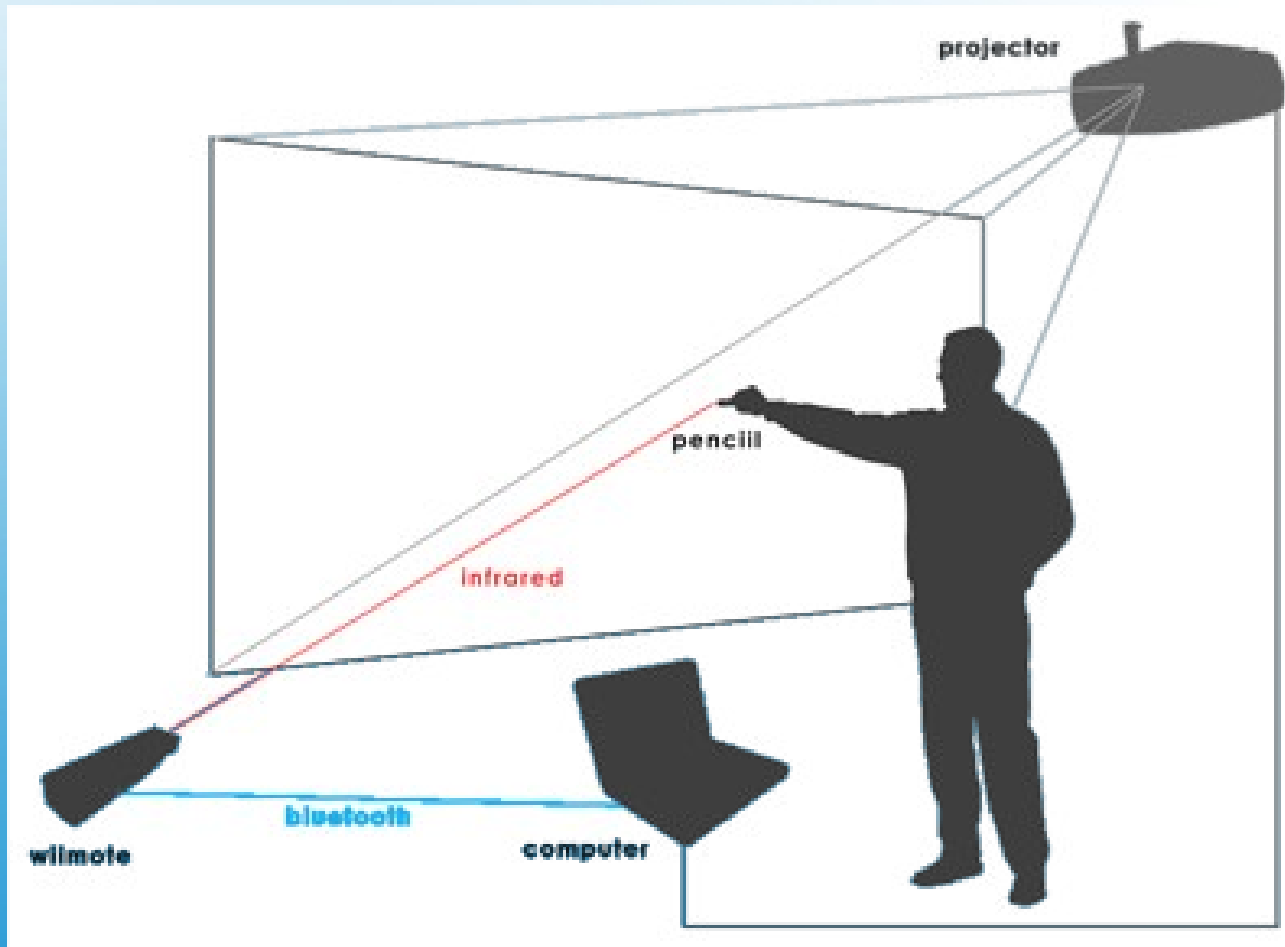
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Johnny Lee



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Lousa virtual (canetas infravermelhas)

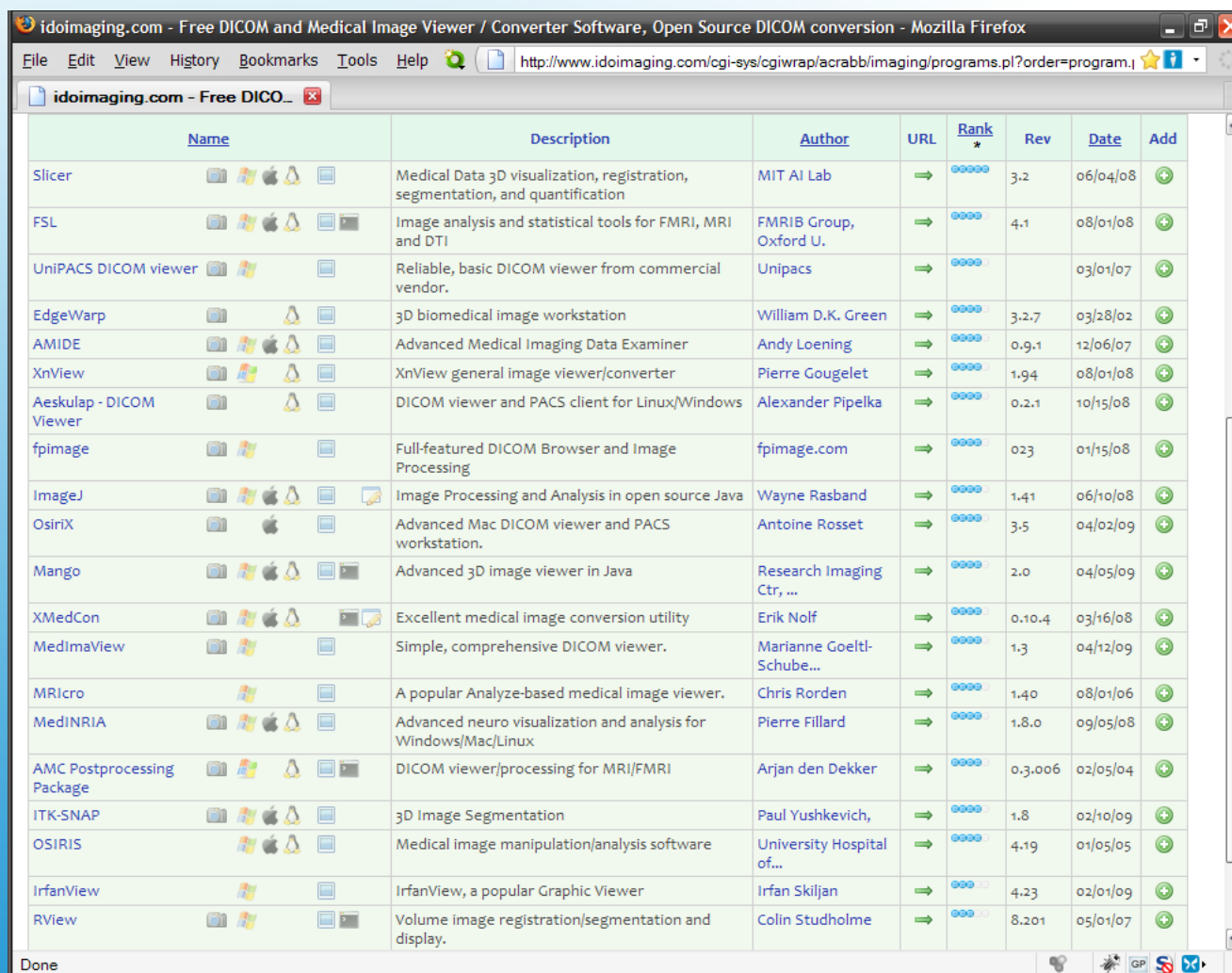


Óculos de visão em perspectiva



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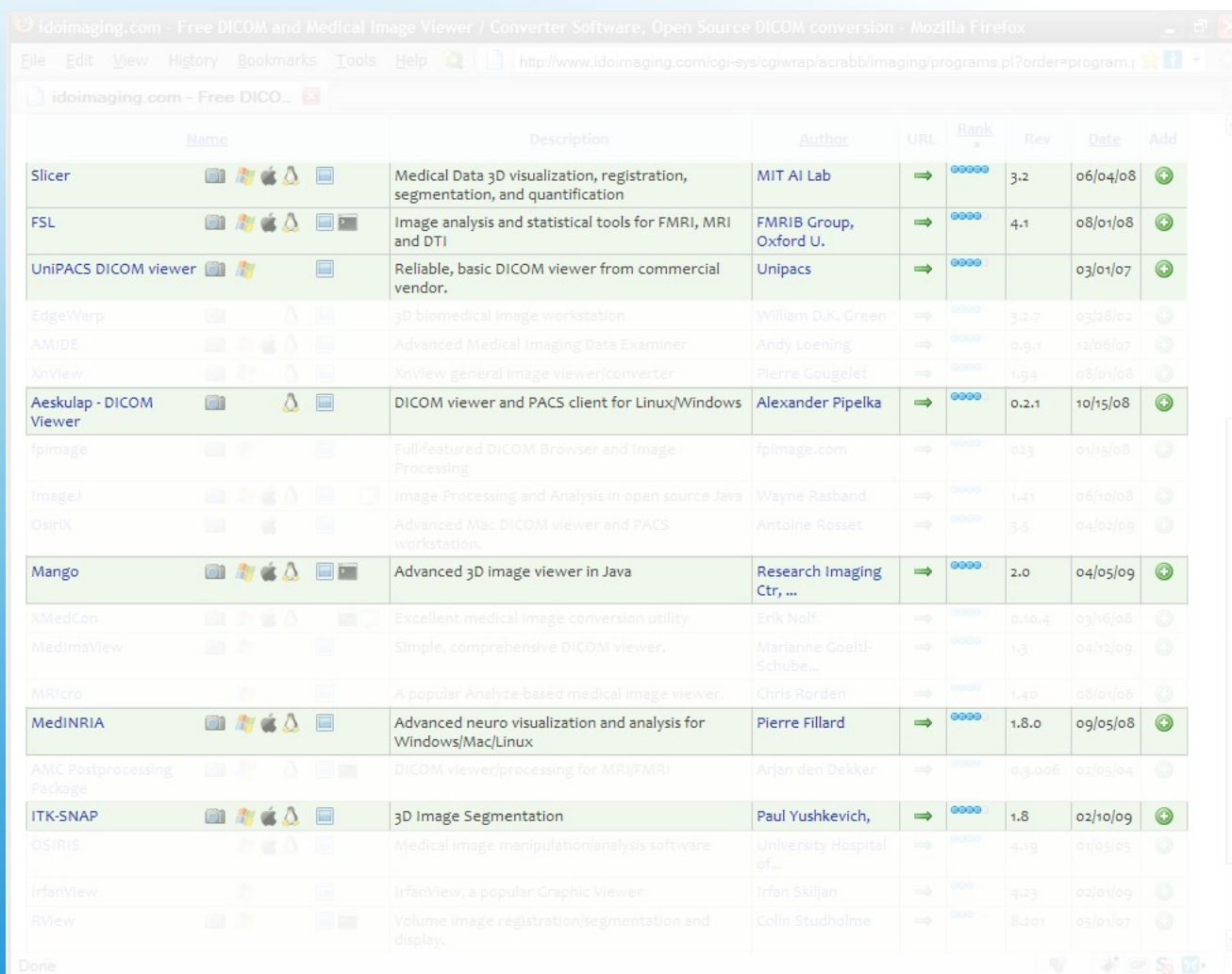
Comparação de programas existentes: idoimaging.com



Name	Description	Author	URL	Rank	Rev	Date	Add
Slicer	Medical Data 3D visualization, registration, segmentation, and quantification	MIT AI Lab	→	00000	3.2	06/04/08	+
FSL	Image analysis and statistical tools for FMRI, MRI and DTI	FMRIB Group, Oxford U.	→	00000	4.1	08/01/08	+
UniPACS DICOM viewer	Reliable, basic DICOM viewer from commercial vendor.	Unipacs	→	00000		03/01/07	+
EdgeWarp	3D biomedical image workstation	William D.K. Green	→	00000	3.2.7	03/28/02	+
AMIDE	Advanced Medical Imaging Data Examiner	Andy Loening	→	00000	0.9.1	12/06/07	+
XnView	XnView general image viewer/converter	Pierre Gougelet	→	00000	1.94	08/01/08	+
Aeskulap - DICOM Viewer	DICOM viewer and PACS client for Linux/Windows	Alexander Pipelka	→	00000	0.2.1	10/15/08	+
fpimage	Full-featured DICOM Browser and Image Processing	fpimage.com	→	00000	023	01/15/08	+
ImageJ	Image Processing and Analysis in open source Java	Wayne Rasband	→	00000	1.41	06/10/08	+
OsiriX	Advanced Mac DICOM viewer and PACS workstation.	Antoine Rosset	→	00000	3.5	04/02/09	+
Mango	Advanced 3D image viewer in Java	Research Imaging Ctr, ...	→	00000	2.0	04/05/09	+
XMedCon	Excellent medical image conversion utility	Erik Nolf	→	00000	0.10.4	03/16/08	+
MedImaView	Simple, comprehensive DICOM viewer.	Marianne Goeltl-Schube...	→	00000	1.3	04/12/09	+
MRicro	A popular Analyze-based medical image viewer.	Chris Rorden	→	00000	1.40	08/01/06	+
MedINRIA	Advanced neuro visualization and analysis for Windows/Mac/Linux	Pierre Fillard	→	00000	1.8.0	09/05/08	+
AMC Postprocessing Package	DICOM viewer/processing for MRI/FMRI	Arjan den Dekker	→	00000	0.3.006	02/05/04	+
ITK-SNAP	3D Image Segmentation	Paul Yushkevich,	→	00000	1.8	02/10/09	+
OSIRIS	Medical image manipulation/analysis software	University Hospital of...	→	00000	4.19	01/05/05	+
IrfanView	IrfanView, a popular Graphic Viewer	Irfan Skiljan	→	00000	4.23	02/01/09	+
RView	Volume image registration/segmentation and display.	Colin Studholme	→	00000	8.201	05/01/07	+

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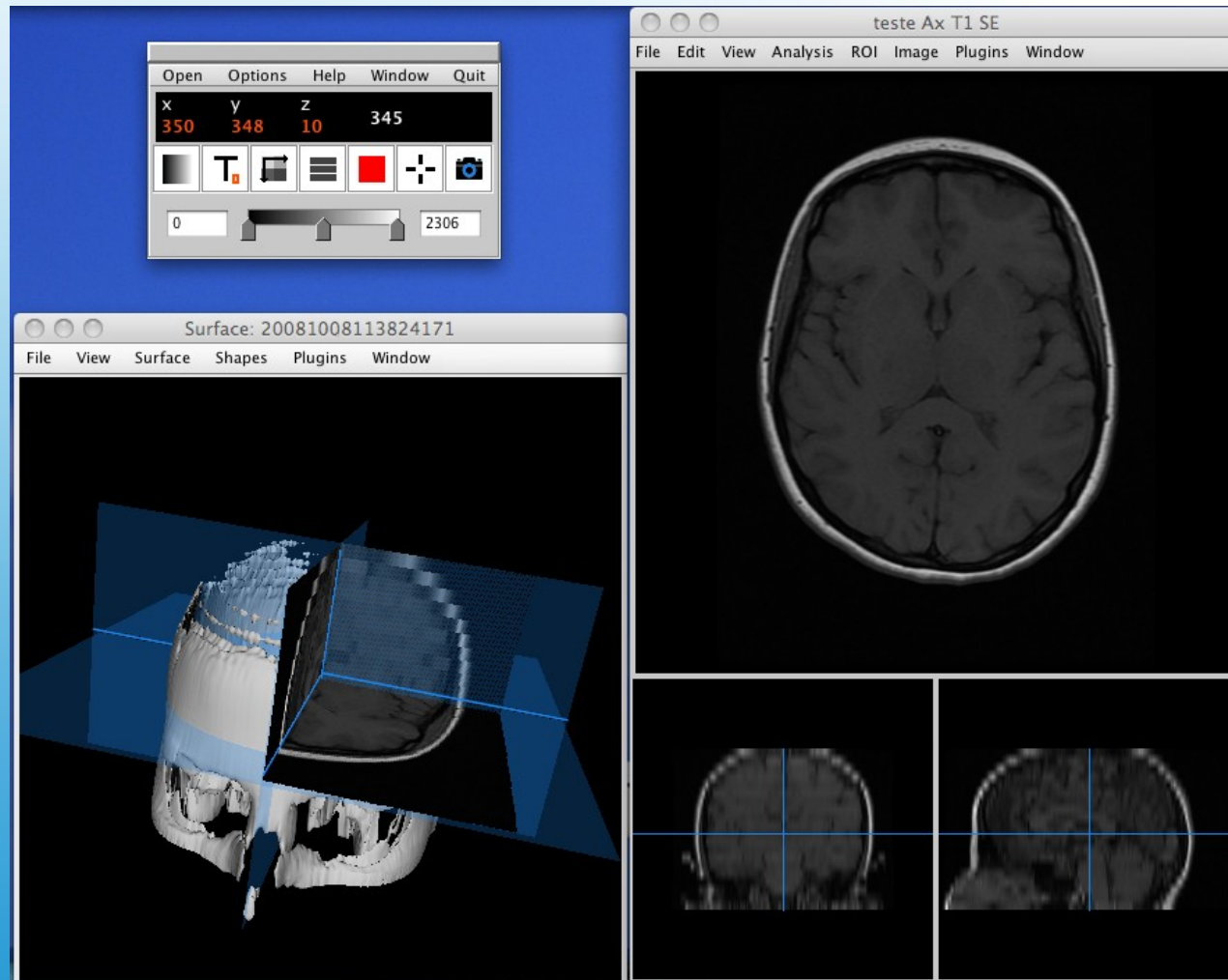


The screenshot shows a web browser window displaying the idoimaging.com website. The page lists various medical image viewer and processing software. The table below is a representation of the data shown in the screenshot.

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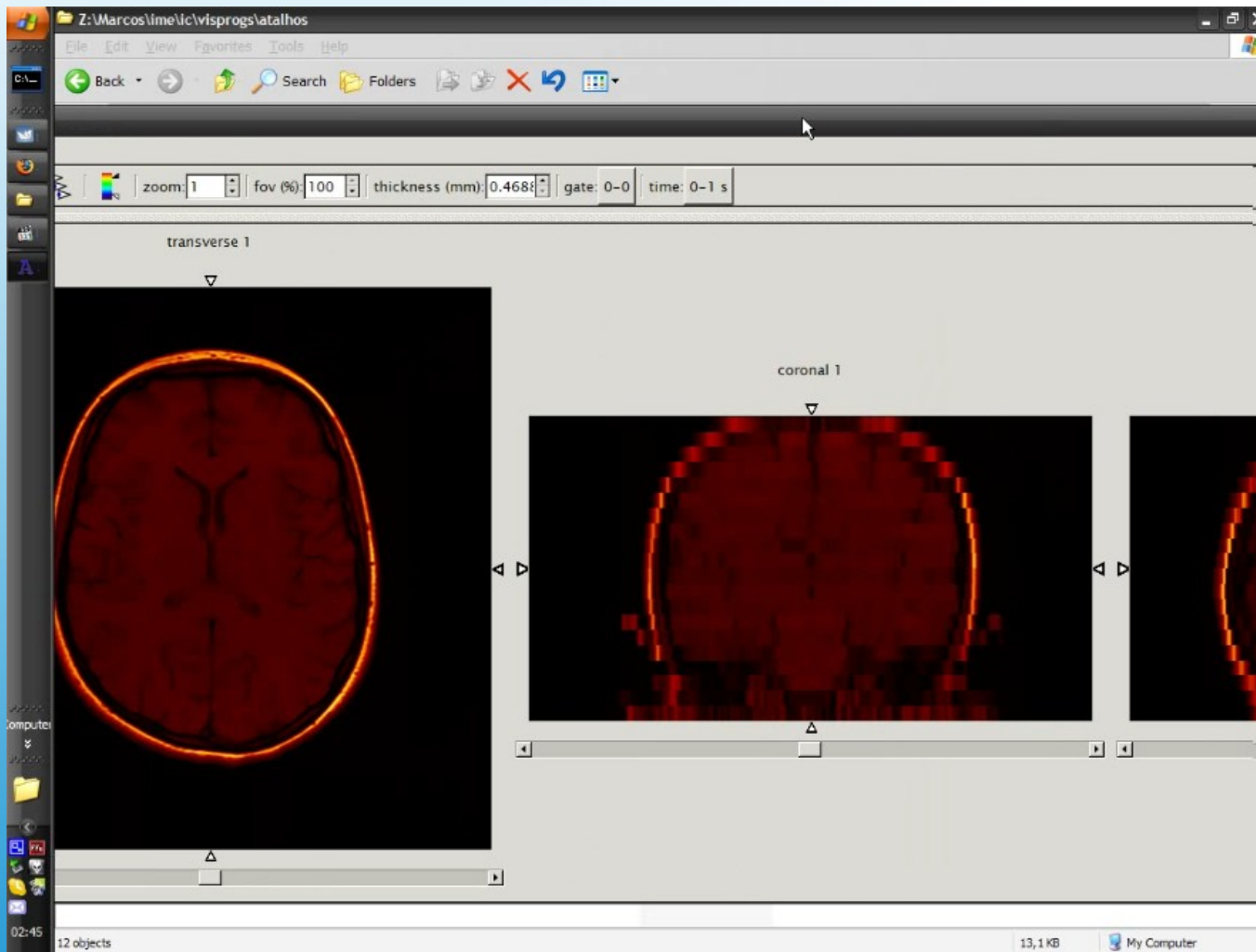
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Programas existentes: cara padrão



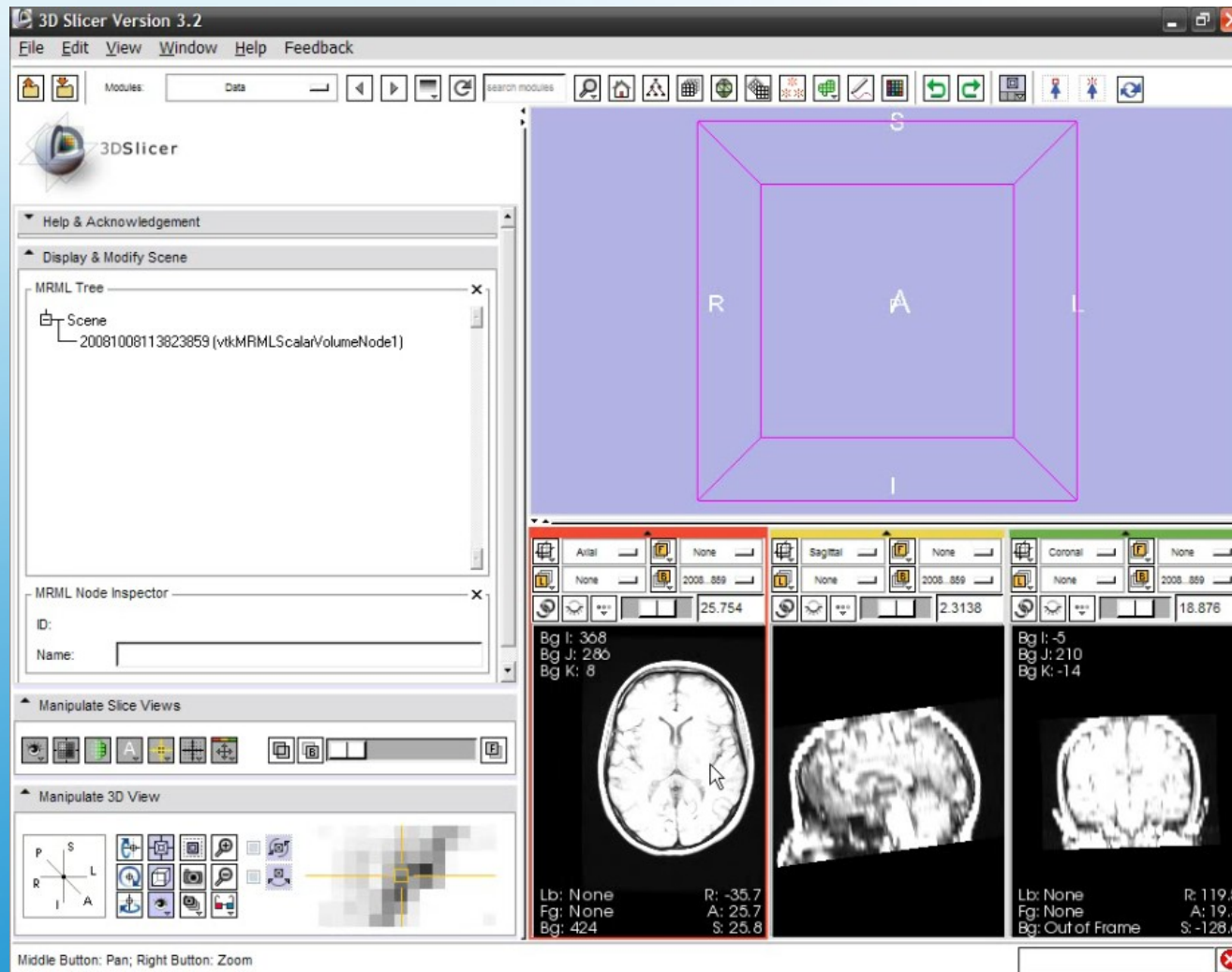
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Programas existentes: ???!



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Programas existentes: pesado e complicado



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Programas existentes: espécime raro



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Lentidão e impasse no desenvolvimento

- VTK complicado demais, documentação muito pobre
- Compilação demorada: impossibilidade de testes freqüentes
- E principalmente: **já fizeram isso antes!***

Curto prazo?

Não dá!

Interface?

Fácil!

* com um detalhe: não resolve o problema inicial, que é acoplar uma interface ao Bioline & friends cia. Ltda.

Acoplar aos

outros programas?

Dureza!

- Apenas duas opções reais:

Pensar em curto prazo: sem perspectivas de futuro

Pensar em longo prazo: sem pressa!

A saga, parte 3: Reformulação

- ~~VTK complicado demais, documentação muito pobre~~
- ~~Compilação demorada: impossibilidade de testes frequentes~~
- ~~E principalmente: **já fizeram isso antes!***~~

~~* com um detalhe: não resolve o problema inicial,
que é acoplar uma interface ao Biolumage & friends cia. Ltda.~~

- ~~Apenas duas opções reais:~~
- ~~Pensar em curto prazo: sem perspectivas de futuro~~

Pensar em longo prazo: sem pressa!

Plataformização
Desacoplamentação
Modularização
Pythonização
Padronização
Integração
Divulgação
Colaboração

...
Profit!

A saga, parte 3: Reformulação

- Abordagem ambiciosa de longo prazo
- Foco na distribuição do trabalho e atração de colaboradores
- Arquitetura modular (inspirada no Eclipse)
- Projeto agora engloba outros projetos
- Perfis de usuários: clínico, pesquisador, desenvolvedor
- Canais para feedback de usuários
- Prioridade para facilidade de extensão do software
- MVC e separação geral de preocupações
- Suporte a automatização qualquer tarefa (Python)

Plataformização

Desacoplamentação

Modularização

Pythonização

Padronização

Integração

Divulgação

Colaboração

...

Profit!

A saga, parte 4: Identidade do projeto



- “Inclusão oficial” dos membros do grupo de pesquisa
- Inclusão do Prof. Choukri em Harvard
- Escolha do nome
- Definição da missão
- Definição dos canais de comunicação
- Criação do logotipo e identidade gráfica
- Escolha da licença do software
- Definição das funcionalidades planejadas

Escolha da licença do software

Open Source Licenses

Approved by the OSI

Copyleft

GPL-compatible

“Linkable” to other licenses

Popular:

LGPL: natural choice

Version 2.1 or 3.0?

- 2.1 allows upgrade to 3.0

Not so popular:

EURL: special circumstances

Complex legal mechanics:

- Is it worth it?

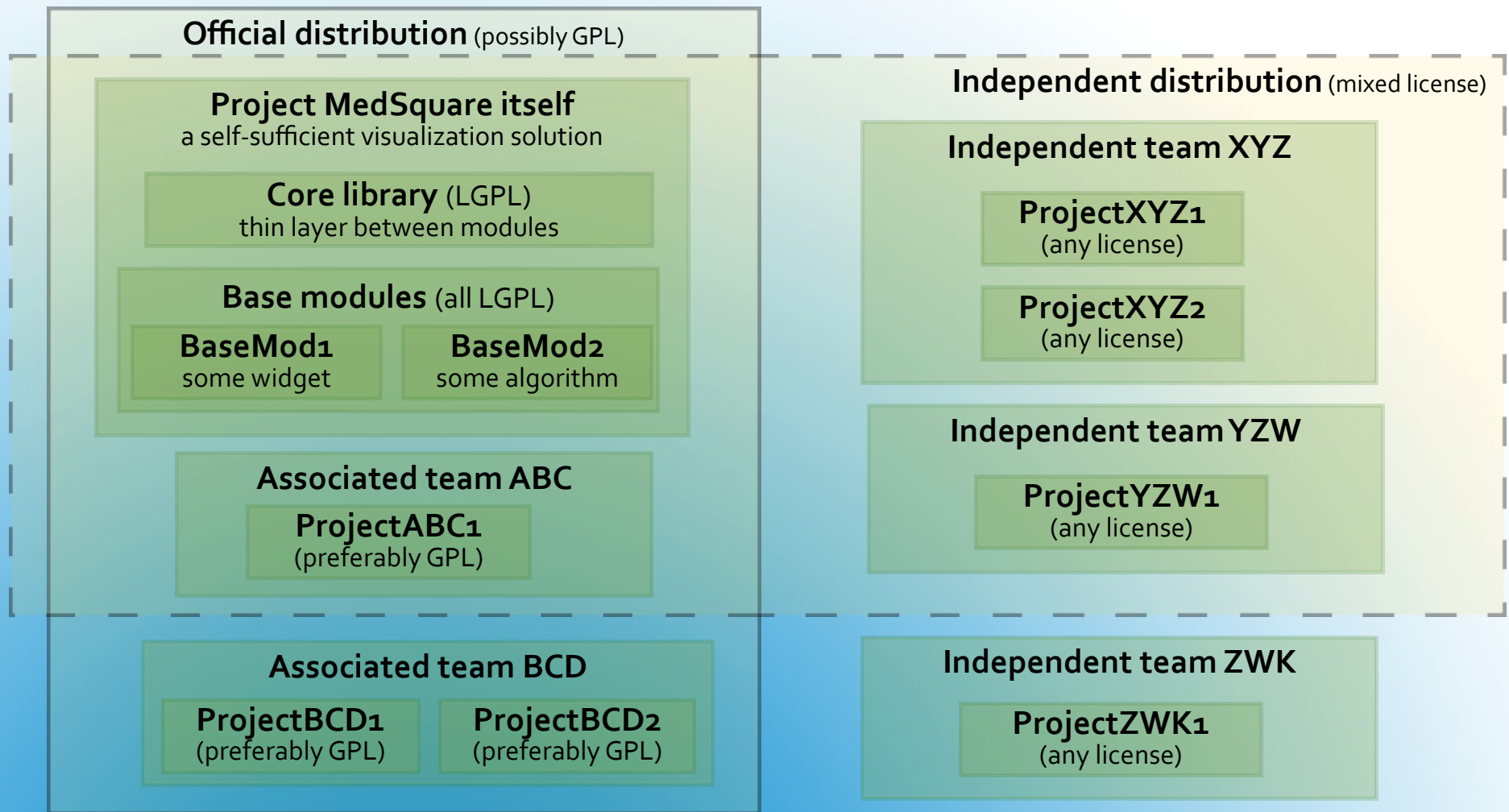
“Non-linkable” to other licenses: GPL, AGPL

GPL-incompatible: EPL (Eclipse), MPL (Mozilla), CDDL (Sun)

Permissive: MIT, BSD, Apache

Not approved by the OSI: CeCILL (France)

Modelo de desenvolvimento distribuído



Modelo de desenvolvimento distribuído

Nenhuma comunicação direta é permitida entre módulos.

Graças à API sob a LGPL, usada obrigatoriamente como mediadora entre os módulos, a compatibilidade legal e técnica é mantida.

Wiki

The screenshot shows a web browser window titled "StartPage - MedSquare" with the URL "http://www.medsquare.org/". The page features the MedSquare logo and the tagline "open source medical image exploration". A search bar is located in the top right corner. The main content area is titled "What is MedSquare about?" and includes a list of features: Free (released under the LGPL), Modular (joining pieces of software), Scriptable (easy automation using Python), Cross-Platform (available for Windows, Linux, and Mac OS X), and Simple and intuitive (focused on usability and efficiency). A warning message states that official project pages are still under construction. The page also includes a "Discover and contribute" section encouraging users to share their knowledge and a "HelpOnWiki" page for more information.

StartPage - MedSquare

http://www.medsquare.org/

Search: Titles Text Login

MED SQUARE | open source medical image exploration

Start page Recent changes Find page Help contents

StartPage Locked History Attachments All Actions

The project

- ✓ Features
- ✓ Requirements
- ✓ License
- ✓ FAQ

Downloads

- ✓ Releases
- ✓ Screenshots
- ✓ Sample data sets

Open wiki

- ✓ User help
- ✓ Wiki help
- ✓ Navigation

Development

- ✓ Documentation
- ✓ The team
- ✓ Join us

What is MedSquare about?

Our aim is to create a powerful and flexible modular environment for exploration of medical images, for both medical and scientific purposes.

We want it to be:

- ★ **Free:** released under the [LGPL](#), it will always be free to use, free to copy and free to tinker with.
- ★ **Modular:** it's all about joining pieces of software, sharing resources and combining features.
- ★ **Scriptable:** easy automation of any task, according to your needs. [Python](#) is our tool of choice for that.
- ★ **Cross-Platform:** available for the most popular operating systems ([Windows](#), [Linux](#) and [Mac OS X](#)).
- ★ **Simple and intuitive:** focused on usability and efficiency with no need for software training.

Right now MedSquare is at a very early stage of development, so you won't be able to see anything working yet. But if you're interested in our ideas, you can take a look at our [development portal](#), [subscribe](#) to our announcements, or [contact us](#).

⚠ *The official project pages are still under construction.*

Discover and contribute

We want you to have easy access to all kinds of information on our software, and we want you to feel encouraged to share your own knowledge. That's why we chose to create this website as a [wiki](#). You can make small contributions, like correcting typos, or bigger ones, like writing a whole page. Or you can just browse through page links. It's all up to you.

If you feel like contributing, please take the time to read the [HelpOnWiki](#) page. Note that some official project pages are locked and only editable by project members, but all other pages can be freely edited by any [registered](#) user.

Página para divulgação

MEDSQUARE open source software for medical image exploration

The project Roadmap Knowledge base (wiki) Development About us

researchers

- physics simulation
- data integration
- automation of every task
- python scripting

clinicians

- several visualization modes
- registration and segmentation
- web integration
- support for portable devices

developers

- modular architecture
- simple a.p.i.
- customizable profiles
- uncluttered, intuitive interface

get medsquare

cross-platform

The MedSquare project

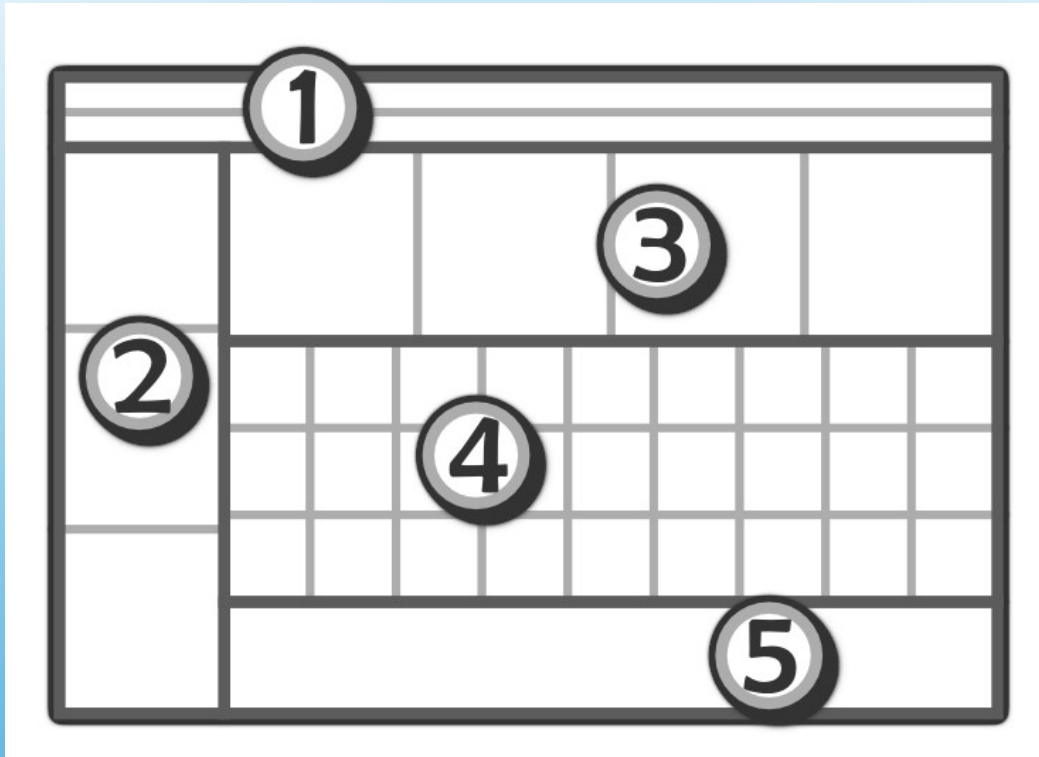
MedSquare is an ambitious initiative aimed at providing means for efficient development and integration of software tools for exploration of medical images. With this initiative, we hope not only to create a powerful software environment capable of meeting the high standards of the medical community, but also to promote the active exchange of knowledge in a collaborative network of clinicians, researchers and developers throughout the globe.

SourceForge

The screenshot shows a web browser window displaying the SourceForge MedSquare Feature Requests tracker. The browser's address bar shows the URL: http://sourceforge.net/tracker/?atid=1192746&group_id=281115&func=browse. The page title is "MedSquare" and the breadcrumb navigation includes "Summary", "Files", "Support", "Develop", "Tracker", "Mailing Lists", "Forums", and "Code". The "Tracker" tab is selected. Below the navigation, there is a search bar with a "Search" button and a link to "Advanced" search. The page indicates "Page: 1 2 Next »" and "1 - 10 of 17 Results - Display 10". A table lists 10 feature requests, each with a unique ID, a summary, status, opening date, assignee, submitter, and priority. The table is filtered by "Assignee: Any", "Status: Any", "Category: Any", "Group: Any", and "Submitter: mbonci". The table data is as follows:

ID	Summary	Status	Opened	Assignee	Submitter	Priority
2887426	format-support-vtk	Open	2009-10-27	nobody	mbonci	7
2887424	ui-file-management	Open	2009-10-27	nobody	mbonci	7
2887423	ortho-view-3dpane	Open	2009-10-27	nobody	mbonci	5
2887422	alternative-input-devices	Open	2009-10-27	nobody	mbonci	3
2887421	alternative-input-methods	Open	2009-10-27	nobody	mbonci	3
2887420	wiimote-support	Open	2009-10-27	nobody	mbonci	2
2887419	corellb-integration-interface	Open	2009-10-27	nobody	mbonci	5
2887418	data-manipulation-model	Open	2009-10-27	nobody	mbonci	5
2887415	grid-view	Open	2009-10-27	nobody	mbonci	8
2887414	ortho-view	Open	2009-10-27	nobody	mbonci	8

Elementos principais em desenvolvimento



1. Menu e barra de ferramentas
2. Ferramentas dos módulos
3. Cortes ortogonais + Quadro 3D
4. Cortes em seqüência
5. Painel de scripting

Ad continuum

Passo atual: detalhamento da API

Versão beta esperada para os próximos dois meses

Futuro

iPhone, serviços pela web, Wiimote de volta

E etc e tal!