

# VSRC Computer Module

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## Services and Equipment

The **VSRC Computer Module** provides VSRC members with design and development of custom software for data acquisition and analysis, technical support and assistance with computer hardware and software. The Computer Module administers VSRC network and developed and maintains VSRC web site and online scheduling services.

### Services include

- ✓ development of specialized real-time and off-line laboratory software
- ✓ development of customized hardware/software interfaces
- ✓ computer assistance, maintenance and upgrades
- ✓ website authoring, hosting and development of web applications
- ✓ network administration for the Worrell building
- ✓ development and maintenance of online scheduling services for shared instrumentation
- ✓ scientific poster printing and poster design
- ✓ acting as interface with UAB and the School of Optometry IT services

### Equipment

Large Format Poster Printer HP T770, Work Stations, Color Scanner, Color Laser Printer, Slide/Film Scanner, Servers, Switches, Hubs, etc.

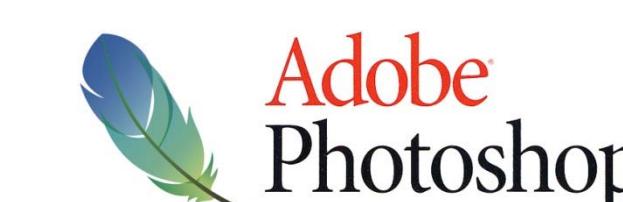
### Poster Printing



The VSRC Computer Module offers printing service to Vision Science Research Center, School of Optometry, and related departments. The module possesses a large format inkjet plotter, Hewlett Packard DesignJet T770.

This photo-realistic printer has a 42-inch wide capacity and can print onto rolls up to 100 feet in length. The HP DesignJet T770 plotter produces great-looking posters, with brilliant colors at a resolution of 1200 dots per inch at a low cost for faculty and staff.

## Web Design and Administration



The VSRC Computer Module web page

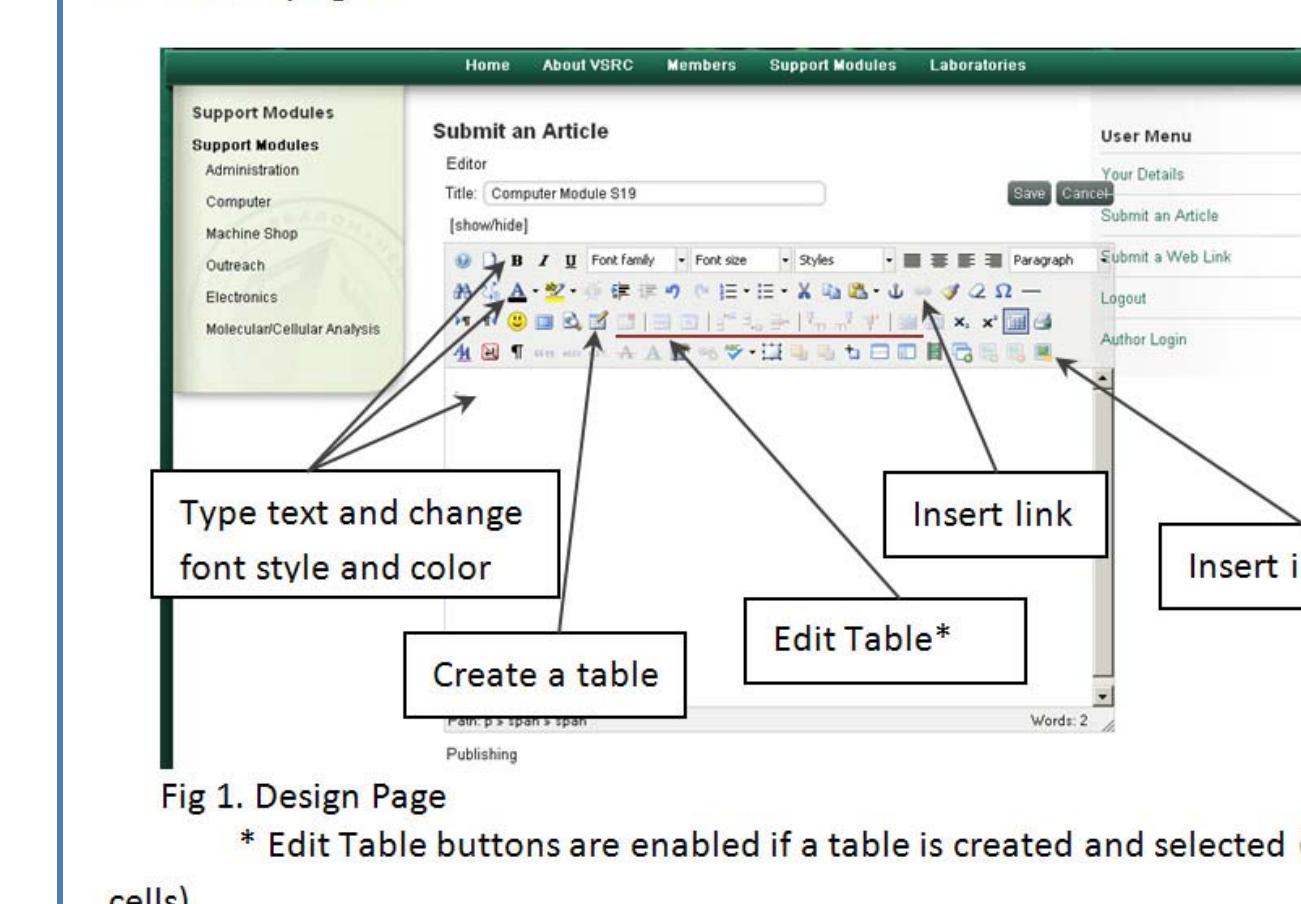
<http://www.uab.edu/vsrc/support-modules/computer>

The Computer Module designed and administers the VSRC web site. The site was developed using content management system Joomla! It is hosted on a UAB web server at the Web Communications Department and is administered by the Computer Module remotely.

The site allows each VSRC member to create, populate, manage and update web pages and to upload images and video files directly to the server. All new VSRC pages created by users carry the same background and design with a VSRC logo, a header, and a horizontal menu bar on the top. The side menu bar is optional and can be created and managed by the administrator.

The Computer Module provides user manuals with instructions how to add and edit page content and easy to follow text and video step-by-step tutorials how to create basic pages.

edit page, click **Edit Article** button that's in the top right corner of the blank page. That takes you to the design page that looks similar to older version of MS Word that all of us are familiar with. Actually, you can design part of the page in MS Word and then copy and paste it into the designer window. The web page will be although not exactly like but very similar to the Word page.



A screen sample from a section of the user manual to create web pages on the VSRC web site. The manuals are available to view or download on <http://www.uab.edu/vsrc/laboratories>

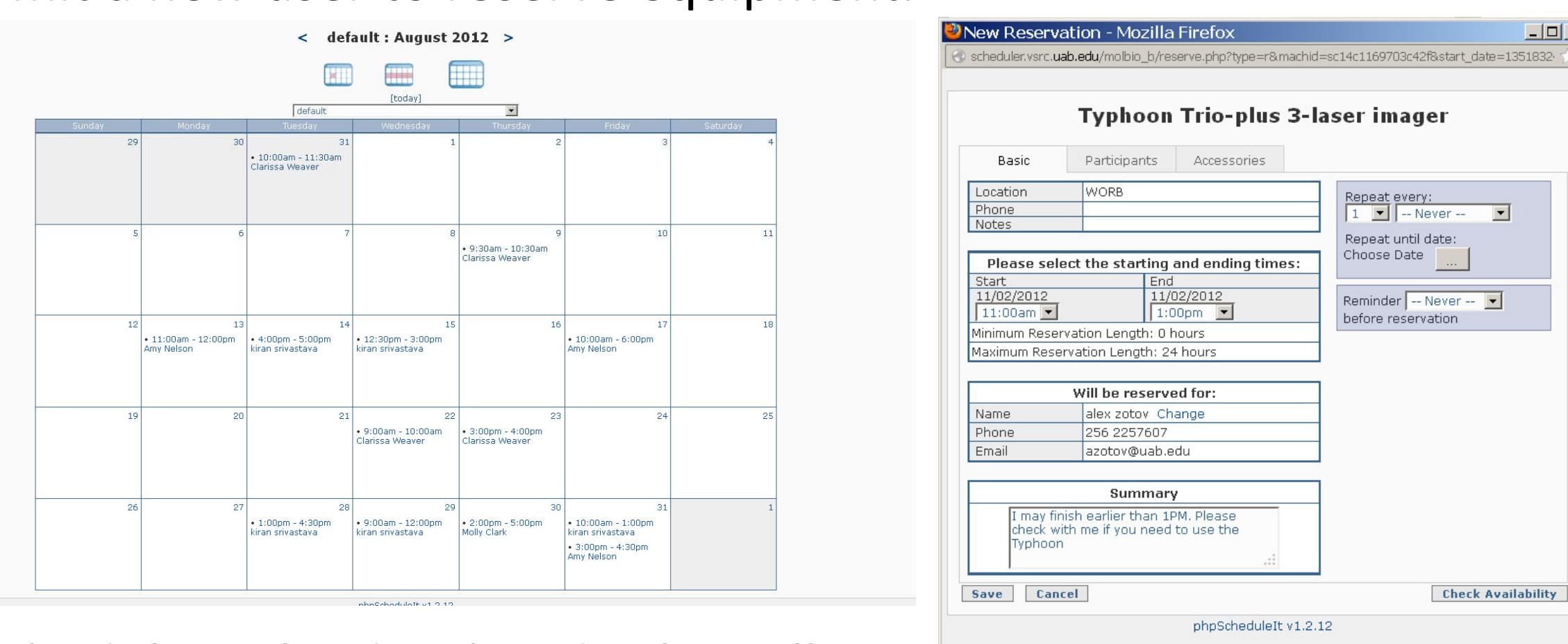
## Web Programming

### Online Equipment Schedulers



The computer module created, hosts and administers multiple online schedulers that allow the affiliates to reserve shared equipment in the VSRC Cell/Molecular Analysis Module and Imaging facilities online.

All affiliates can register as users and view reservations immediately. To prevent unauthorized reservations, an administrator has to permit a new user to reserve equipment.

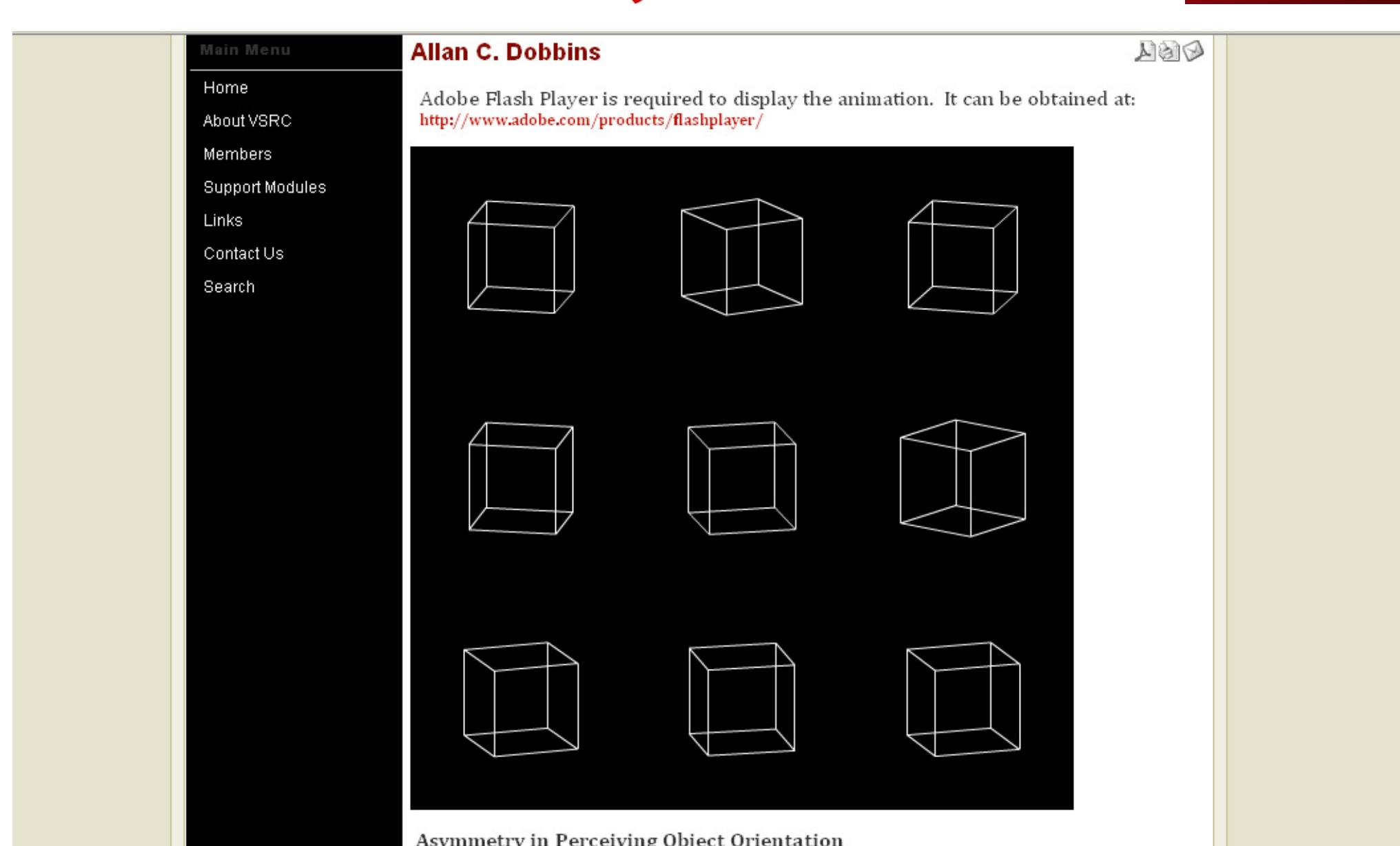


A scheduler calendar that displays all posted reservations and can be viewed online by all registered members at any time.



The available equipment can be reserved online by all registered members by filling a form.

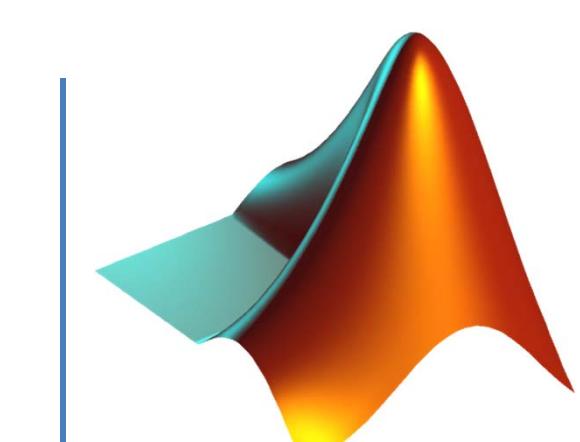
### Web Applets



A fully interactive display created as an animated figure for one publication authored by Dr. A. Dobbins. The bistable wire cubes continuously rotate and the user can control the presentation by changing the axis of rotation, the number of cubes displayed, speed of rotation, and tilt of the cubes by simple button presses on the keyboard. The animation can be viewed at [www.vsrc.uab.edu/adobbins](http://www.vsrc.uab.edu/adobbins)

## Software Systems

### Psychtoolbox

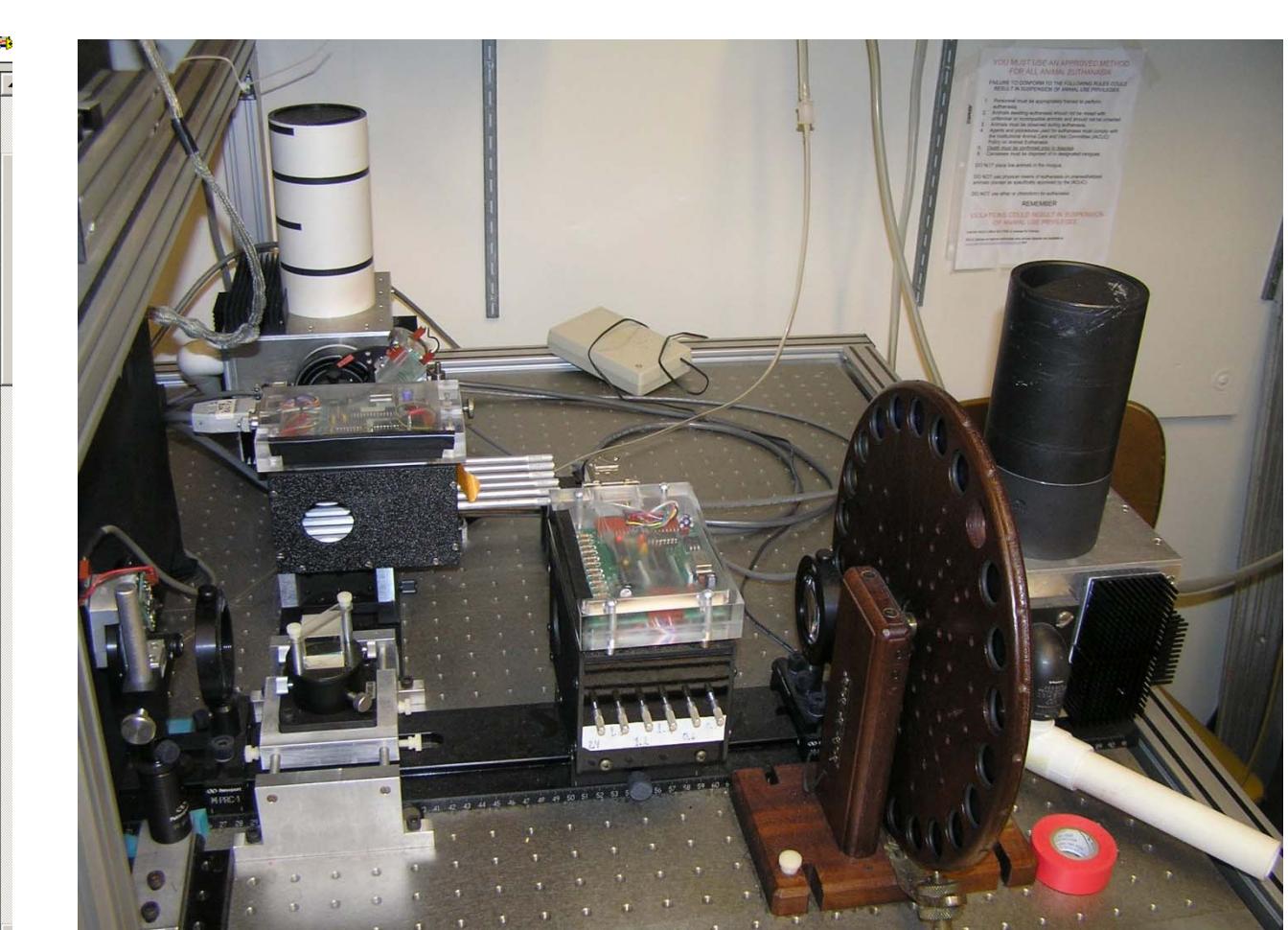
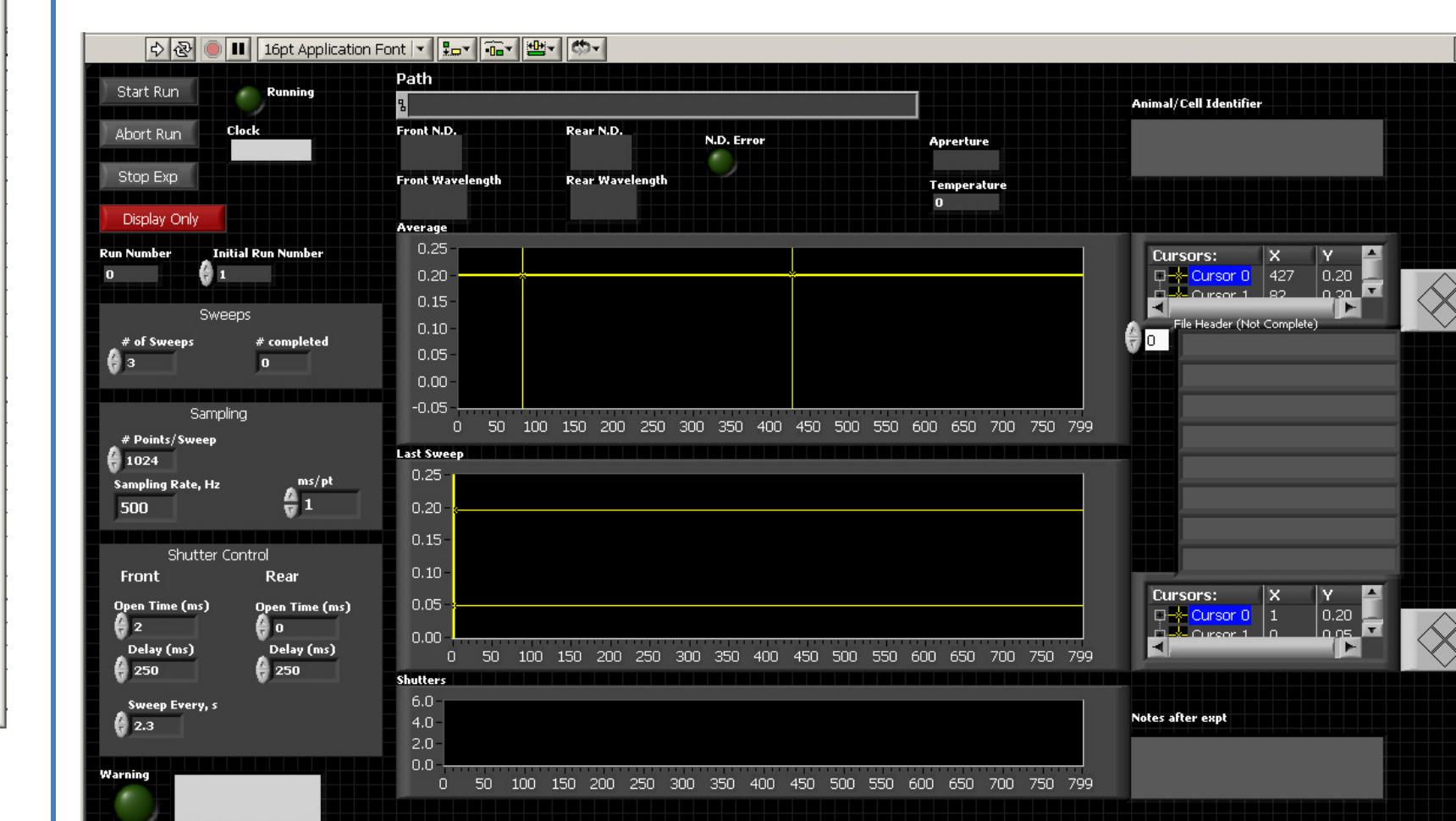


### Data Acquisition and Visual Stimulation

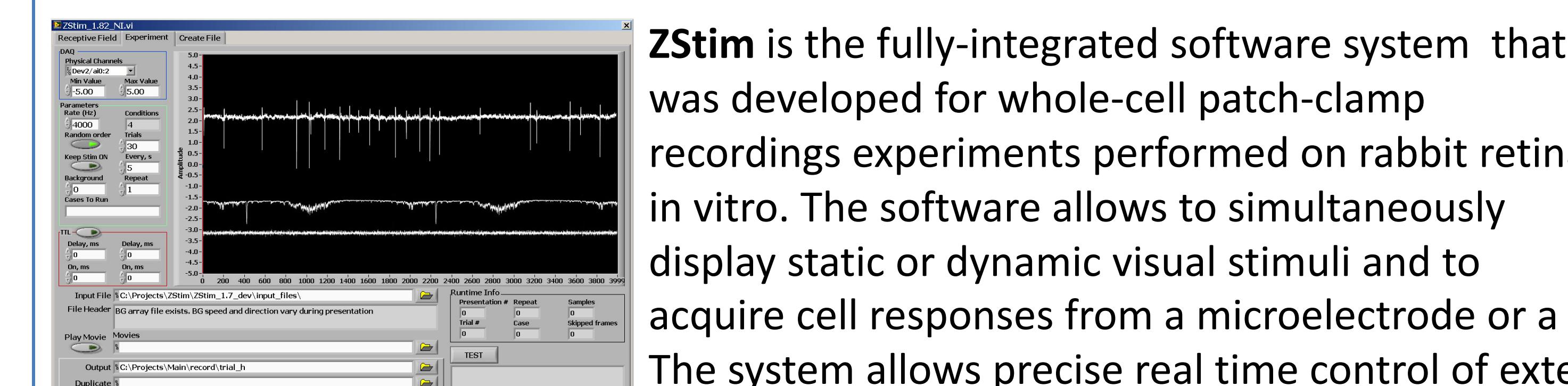
The VSRC Computer Module developed four separate fully-integrated software systems to execute and control whole-cell patch-clamp recordings performed on retinas in vitro. The systems control visual stimulation, record cell responses, and drive external devices during the experiments. Two of the systems generate and display custom stationary or dynamic visual stimuli on the secondary monitor. The other two systems control external light sources for visual stimulation.

All of the systems allow precise control of operation of external devices like pumps, picoinjectors, etc. by generating high speed digital outputs.

The systems are currently used in several laboratories at the VSRC and are actively supported and updated by the Computer Module.



A system developed for and used at Dr Kraft Lab controls light shutters to deliver visual stimulation from multiple light sources to retina. The system acquires and records cell responses and specifications of light beams, real time temperature of the preparation, timing of stimulation and other parameters.

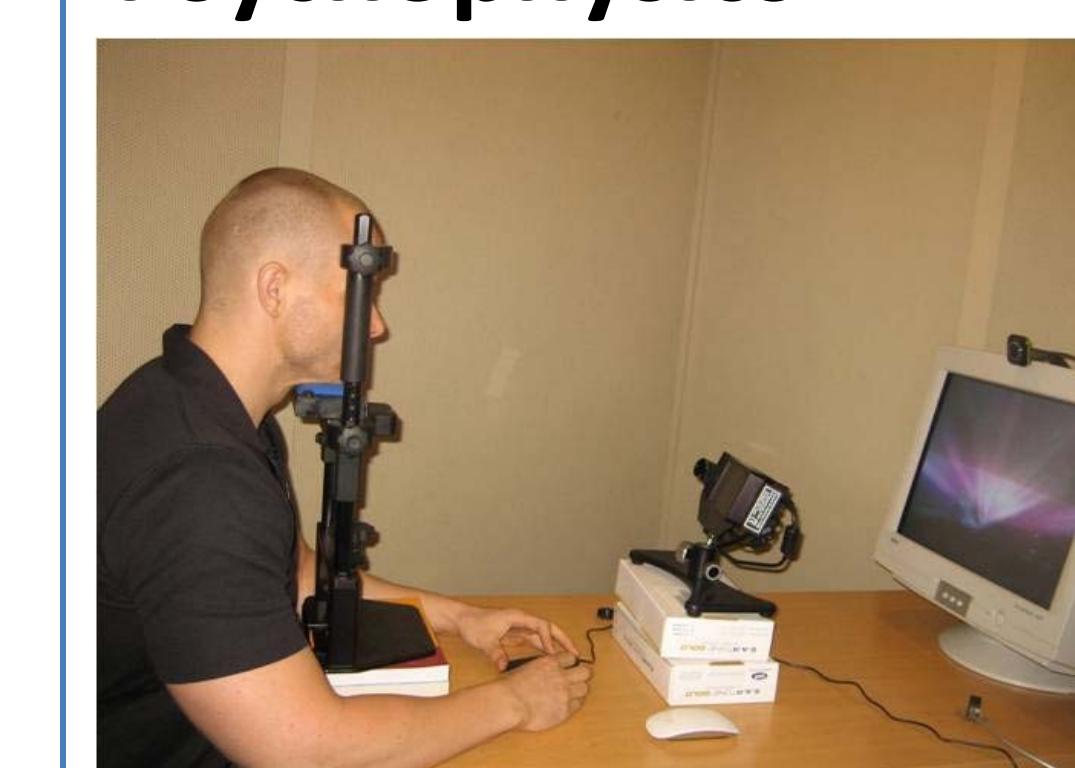


**ZStim** is the fully-integrated software system that was developed for whole-cell patch-clamp recordings experiments performed on rabbit retinas in vitro. The software allows to simultaneously display static or dynamic visual stimuli and to acquire cell responses from a microelectrode or a microelectrode array. The system allows precise real time control of external devices.

A: The GUI allows the investigator to specify parameters of experiment execution, data acquisition and recording. All parameters of the visual stimuli can be preselected using input files.

B: Visual stimulus image can be superimposed on the background or a 1-bit mask can be used to define where the background and the stimulus are visible. Stimuli can be of any shape, stationary or dynamic, and the same is true for the background.

### Psychophysics



Speed of Processing system developed using Matlab for lab of Dr. Visscher. The system generates and displays visual stimuli and collects and records subject responses. The system monitors eye movements before, during, and after the Speed of Processing training.

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