



**VISUALIZATION  
& DIGITAL  
IMAGING LAB**

**'05-'07**

---

**BIANNUAL  
REPORT**

cover image: Snoscape  
by **Alyce Coker**  
Art & Design

---

# MISSION STATEMENT

## **The Visualization and Digital Imaging Laboratory (VDIL) was conceived in 1999 through the vision of**

UMD Chancellor Kathryn Martin as a limited access facility, open to faculty members and their research associates and students whose primary interest is in high-end visualization projects. The laboratory is a collaborative facility of the School of Fine Arts and College of Science and Engineering. It provides a dynamic multi-media environment for design and scientific researchers to conduct original research in the areas of animation, visual imaging and scientific visualization. The laboratory integrates design research in the areas of computer graphics, two-dimensional imaging, virtual reality applications and sound/image control.

---

---





**Relevant Resources** : Check it out

From 2005 through 2007, over 450 items were loaned to VDIL researchers. This equipment ranges from laptops and video cameras to technology periodicals.

---

# MESSAGE FROM THE EXECUTIVE COMMITTEE

**The Visualization and Digital Imaging Laboratory is becoming an increasingly important research facility**

for faculty at the University of Minnesota Duluth. More than 127 faculty and graduate students now have access to this state-of-the-art laboratory. By providing modern computer graphical input and output devices, increased computational power, specialized digital audio and video recording and analysis capabilities in a central campus location, the VDIL has become an integral part of a wide variety of research projects for artists, scientists, musicians and others on the UMD campus. The VDIL Executive Committee has been charged by Chancellor Martin to keep the VDIL at the forefront of computer visualization and imaging technology, and continues to seek input from faculty in order to improve access and other services.

Congratulations to those faculty members whose research projects are highlighted in this report, and thanks to the VDIL staff and graduate research assistants who help guide faculty and graduate students to full utilization of this technology.

# AHEAD OF THE CURVE

## **The Visualization and Digital Imaging Lab showcases emerging technology in a variety of fields from biology**

to engineering and music. Lisa Fitzpatrick, lab coordinator, keeps current on all levels with technological advances by bringing in demonstrations and obtaining new technology for specialized research.

Improvements in the sound capture facility include a Shure PGX4 Wireless Lavalier Mic wireless lavalier mic kit; a pop-blocker; new Mac intel computer with ProTools MBox 2 Pro LE sound editing system, as well as various plug-ins and music track software from Garageband, Garriton and East-West Symphonic Choirs. The enhanced sound recording studio has an air-intake buffer to reduce ambient noise and a studio layout conducive to recording voice-over narration, vocal or small instrumental groups.

The lab has made significant scientific software additions, such as AmberWaves Forager insect tracking software, which improves capacity for in-depth study of insect behavior. Fledermaus from IVS 3D is a world-class interactive 3D visualization and analysis software providing innovative geo-spatial solutions. Insight II from Accelrys, a sophisticated molecular-modeling environment, provides a powerful graphical interface to best-of-breed algorithms for molecular dynamics, homology modeling, de novo design, and electrostatics—making it the perfect solution for protein modelers, computational chemists, and structural biologists. Currently

the lab staff is exploring various options for both quantitative and qualitative research, such as SPSS, Minitab and NVivo. Linux software has been ported to a Virtual Machine Server, enabling greater research capacity for remote processing.

The lab continues to upgrade computers and software. The MacBook Pro G5 laptop with glossy screen handles the various presentations in the lab, as well as serving as a portable imaging tool. The new Dell XPS Gen5 facilitates 3DStudioMax modeling and Scion imaging software, among others. The new PowerMac G5 with the unique Wacom Cintiq 21UX interactive pen display combines the advantages of an LCD monitor with the control, comfort, and productivity of Wacom's most sophisticated drawing tablet technology. By using a pen directly on the screen, researchers in the sciences and arts work much more quickly and naturally. The lab's newly built custom PC has 4 gigs of RAM with SATA hard drives, 64 bit processor, linkable graphics card with SLI interface, and Vista, handling statistical analysis and data mining. Lab software includes the latest versions of Final Cut Pro; Adobe Creative Suite: InDesign, Illustrator, Flash, Dreamweaver, Photoshop; Aperture; Shake; Lolitrack; DVD Studio Pro; iMovie; Mathematica; Phoretix; MatLab; Gaussian; Finale and Fontographer, among others. The lab has a blog for researchers and alumni and also researches and produces podcasts (see Graduate Studies).

Printing innovations have improved the lab's capabilities. The lab recently purchased an Epson 9800 wide-format archival printer, enhancing ability to print on a variety of formats such as silken polyester and tyvek. The new HP 3800n color laser printer enables researchers to quickly generate colored images. The Graphtec CE 5000 60 vinyl cutter allows researchers to design cutting-edge visuals for environmental graphics.





**Reflecmidia Chromakey Kit**  
Product photos for new Green  
Screen visual production equipment

The lab is making great strides in still imaging as well with the new Fuji FinePix S3 Pro SLR UVIR with lenses and light filters. The Super CCD SR II sensor at the heart of the FinePix S3 Pro UVIR ensures superb image quality and low noise while addressing the issue of wider dynamic range. It captures a wide spectrum from Ultra Violet through visible and into Infrared. Specific wavelengths can be isolated and captured from daylight or artificial light sources via lens filtering or by use of an Alternative Light Source (ALS) such as a forensic crime scope lighting technology. Due to the wide range of light spectrums captured, focusing and exposure are done manually. Unique to the FinePix S3 Pro system is the 30 second B&W live CCD Preview mode from the camera's LCD monitor. This unique mode can be used to focus the camera specifically to the wavelength being captured when dark UV or IR spectrum filters cover the lens, which renders the camera's optical viewfinder unusable. Thanks to the low noise signature of the Super CCD SR II sensor, low light imagery and ALS wavelength specific imagery experiences much less static noise than DSLR's equipped with standard CCD or CMOS sensors. With the RAW file processor and tethered Firewire shooting ability that comes with Fujifilm's HyperUtility software, one can alter the dynamic range or intensify and isolate specific color portions of the image for improved forensic or technical analysis. This includes color image conversion to black and white using the full Bit depth contained in the RAW file and either 8 or 16 bit TIFF files in either sRGB or Adobe RGB color spaces.

The new Canon PowerShot G7 is a 10mp digital still camera with waterproof case, allowing greater versatility for scientific and artistic aquatic exploration. This camera also records up to three minutes of video footage at a time.

#### 4 » Visualization and Digital Imaging Lab

Building on the fast-paced growth of video production in the University, a great deal of equipment has been acquired to facilitate this unprecedented development. The VDIL collaborates with the Multimedia Hub and other entities on campus, such as University Relations, in video production. New camcorders include the Panasonic AG-HVX200P HD and the Sony HDR-FX1HD, which bring high definition video production to the lab. Reflecmidia Chromakey Green Screen Kit, LightRing, and ChromaFlex screen are the production tools used to create special effects such as Harry Potter's invisibility cloak in the film industry. When the light from Reflecmidia's lens-mounted LiteRing hits the Chromatite fabric, the camera sees a perfectly even green background which is ideal for keying. Due to the number of glass beads within the fabric, the camera and LiteRing are free to move and can work at acute angles to the Chromatite. By generating the background color through this retro-reflective process, Chromatite offers unrivalled benefits for advanced video editing. [www.reflecmidia.com](http://www.reflecmidia.com)

The Focus Enhancements FS-4 Pro HD Portable DTE Recorder brings direct-to-edit technology to the handheld camcorder, plus time lapse, retro disk recording, and scene marking. The Fig Rig Stabilizer from Bogen/Manfrotto is a modular system that smoothly supports the DV camera and acts as a frame to mount all the accessories. A circular frame with a crossbar to mount most mini DV cameras allows the Fig Rig to become part of the body to produce smooth, steady traveling shots. The camera, accessories and operator become one, allowing the operator to film scenes quickly and unobtrusively. Two light kits, the Kino Flo Diva Lite 400 System Kit and the Altman Swing Pac Tungsten 3 Light Kit, complete the specialized resources available to lab researchers.

---

# KIOSKS

## **Lisa Fitzpatrick, Visualization and Digital Imaging Lab Coordinator, has directed the design, development**

and construction of two touch screen kiosks, which are now located on the UMD campus. Each kiosk underwent design, development, and testing within the Visualization and Digital Imaging Lab (VDIL). The VDIL at UMD is one of the only educational facilities in the United States which is teaching students how to build informational touchscreen plasma kiosks from start to finish.

### **Swenson Science Building kiosk**

The Swenson Science Building (SSB) kiosk was designed and constructed by Ravi Bharadia, Sam Erickson, Lisa Fitzpatrick, Mahesh Joshi and Robert Linnemann.

The UMD Swenson Science Building kiosk's purpose is twofold: promotional and informational. It includes current events in SSB and also a directional map of the faculty and graduate students' offices in the building. The user-friendly

backend interface allows the chemistry and biology departments to update the information and events themselves.

### **Solon Campus Center kiosk**

Located at the heart of UMD, the Solon Campus Center information touchscreen kiosk provides individuals new to campus with an informative and an interactive way-finding system. The kiosk itself was developed in-house over the summer of 2006 by Visualization and Digital Imaging Lab/Information Technology Systems and Services (ITSS) staff.

The interface is high-tech, yet welcoming, in keeping with the mission of the University. The design process blends the expertise of regular staff with opportunities for graduate and undergraduate student employees.

The UMD Info-Kiosk is a new service for the campus, featuring points of interest to new students and their parents, as well as visitors to UMD. Interactive maps pinpoint key locations for visitors. Photos of campus cultural and athletic facilities highlight these special areas. Brief written descriptions provide overviews of each pertinent area, from the College of Pharmacy to Human Resources and Admissions. The maple cabinetry housing the kiosk was built in keeping with the natural wood design of the Solon Campus Center.

Clock chimes on the hour, composed by Prof. Tom Wegren and SFA music student Andy Reilly, further enhance the ambiance.



Swenson Science Bldg. Kiosk  
Completed Fall 2005

The UMD Info-Kiosk was designed and built by the VDIL/ITSS team of Lisa Fitzpatrick, Melissa Jokela, Paul Nelson and Anthony Rostvold at the request of Chancellor Martin.

## SUMMER GRANTS

**The purpose of this program is to encourage use of the Visualization and Digital Imaging Lab by research groups and individuals.** Grants are intended to encourage researchers to learn how to use the hardware and software tools available in the Visualization and Digital Imaging Lab to enhance a specific research project. Participants are encouraged to share knowledge and skills with other users of the lab.

Priority is given to tenured and tenure-track faculty. Full-time term (nonregular) faculty members and research associates with active research programs are also eligible to apply. Applications are encouraged from all collegiate units, including the Medical and Pharmacy Schools, as well as from NRRI, Sea Grant and LLO. Quality applications from those who have never received a summer grant will be given priority over applications from previous grant winners.

**Following is a selection of some of the Summer Grant awardees over the past two years:**

**“Triumph” for Wind Ensemble, Piano/Synthesizer Quartet, Two Alto Singers & Synchronized Abstract**

**Computer Graphics** Thomas J. Wegren, Professor of Music

My research focused on exploring the creative potential of the Kurzweil PC2 Synthesizer. This instrument will be featured in a tone poem I'm composing entitled “TRIUMPH” for Wind Ensemble (65 musicians), Piano/Synthesizer Quartet (piano/synthesizer, electric guitar, bass guitar, drum set) and two Alto Singers. The visual component will integrate some of John Howe's illustrations (from Sibling's THE MAPS OF TOLKIEN'S MIDDLE EARTH) with original abstract computer graphics. I am seeking a collaborator in graphic visual arts for this creative project. The computer imagery will be created from software designed by Apple from their iTunes Visualizer SDK Developer site – Image Capture SDK, and iTunes Visual Plug-ins SDK. Working with a graphics artist will engender and fortify my knowledge of mixed-media designs, and provide invaluable teaching perspectives for my future students.

**Visualization of Vibration for a Space Truss Structure**  
Prof. Zhuangyi Liu and Andrew Larson, Mathematics

Truss Structures are common in Earth-borne constructions, such as bridges and cranes, as well as in space applications. In recent years there has been renewed interest in inflatable-rigidizable space structures because of the efficiency they offer in packaging during boost-to-orbit. However, research is needed to better understand dynamic response characteristics, including inherent damping, of truss structures fabricated with these advanced material systems.

A mathematical model for a Joint-Leg-Beam system as a basic element of the truss structure has been obtained by Professor Zhuangyi Liu and his colleagues at Virginia Tech. Moreover, numerical solution of the system has been obtained by implementing a finite dimensional approximation scheme and computer programming.

The goal of this project is to identify a proper visualization software package and convert the numerical data into a 3-dimensional animation of the structure and its motion.

**Digitally tracking movement of an exotic fish to curtail migration into the Great Lakes** Margot Bergstrom and Prof. Allen Mensinger, Biology

Round gobies (*Neogobius melanostomus*) first invaded the Great Lakes in 1990 and were found in the Duluth/Superior harbor in 1995. The fish traveled from their native range of the Black and Caspian Seas in the ballast water of large shipping vessels. The round gobies can be recognized by their mottled coloring, fused pelvic fin, and small size. Round gobies live on the bottom and feed on aquatic invertebrates and mollusks when adults.

Two different experiments are carried out to estimate the impact of the round gobies: predator-prey interactions and three week behavioral trials. The predator-prey interactions involve video taping a single fish feeding on small prey at different light levels. The prey (amphipods) is found in their natural habitat and the light levels simulate night, dawn/dusk, and daytime. The video tape is analyzed to measure the distance between the fish and amphipod right before the fish orientates towards the prey and tries to capture it. The angle between the fish and prey at this time is also

measured. The goal of this experiment is to determine if the different species of fish are more successful at detecting prey at different times of the day.

The VDIL purchased Lolitrack video tracking software to aid in the analysis of the digital video from the predator-prey interactions. The video can be imported into this software and track the movement of the predator or prey. Both organisms need to have a mark on their bodies for the most effective tracking. The result of the tracking is an output of x and y coordinates at a selected sampling rate. This software is very effective at tracking fish movement for behavioral analysis.

This research can be applied in several areas. Knowing that round gobies have a more advanced sensory system could be used to improve management practices. The behavioral study results could help assess risk of inland lakes and streams and protect other native benthic fish.

**Complex Visual/Verbal Timing and Layering in Information and Expressive Displays** Prof. Rob Wittig, Art + Design

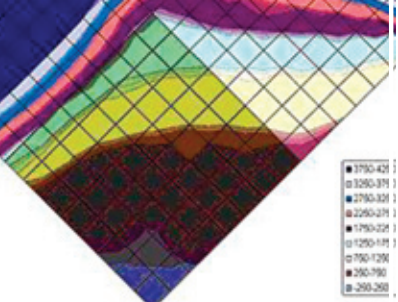
My research concerns the use of type and image on large print surfaces --- posters, scrolls and other large, approachable displays.

Specifically, on the text side, I am investigating the use of very wide ranges of type sizes (from ca. 8 pt. to ca. 320 pt.) within the same text to achieve effects of layering and timing. Certain portions of the text are poster sized and legible from a great distance (20 feet or more), other portions of the text are legible from a medium distance (5-8 feet), and other portions of the text are visible only from quite close (2-3 feet). In many



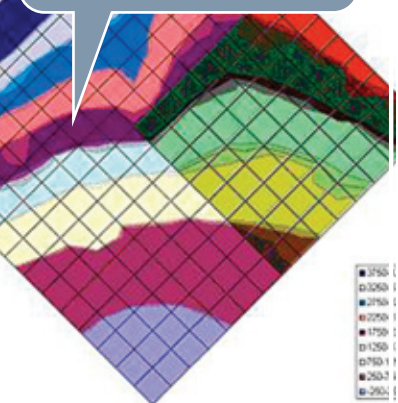
**Andrew Larson**, Graduate Student  
under Dr. Zhuangyi Liu, Mathematics  
Summer Grant 2006



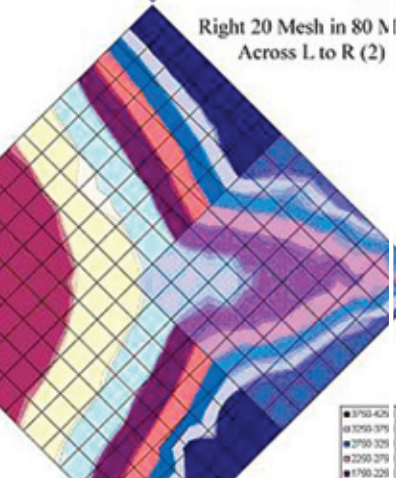


Rt 20 mesh in 80 m:  
Inflow (3)

**Steve Sternberg**  
Chemical Engineering  
Summer Grant 2005



Right 20 Mesh in 80 M  
Across L to R (2)



of my experimental pieces, a certain thought or sentiment is legible from a distance; upon approaching and reading the medium- or short-range text, the reader discovers that the large type can be construed differently when read with the smaller text.

On the visual side I am investigating the use and positioning of simple imagery — often line graphics — and its interaction on large surfaces with other imagery and with text. Using VDIL computing resources I am able to scan and enlarge imagery with a high degree of accuracy.

What I am finding is that the reading experience is enriched by a slow, revelation of complex and often contradictory meanings as the reader draws closer and closer to the object. This is what I mean by timing and layering. The possibilities for creative expression are enormous and exciting. Many of these same principles are also quite useful tools for my colleagues in other fields who are organizing large, visual/verbal information displays.

I would like to express my gratitude to the VDIL program, my research colleagues, and especially the VDIL director and student staff who have supported my research in an extremely effective and professional way. The VDIL is an outstanding resource and an exciting center for innovation at UMD.

**Large-Scale Analysis of Gene Expression in Plant Nectaries** Prof. Clay Carter and Brian Kram, Biology

Several members of the Brassicaceae plant family are cultivated as principal agricultural crops around the world; some of the more notable members include: canola, cabbage, cau-

liflower, broccoli, and various mustards. *Brassica rapa* serves as a major source for canola/rapeseed oil, which accounts for 13% of the oil produced annually by humans for consumption. Due to its largely self-incompatible nature, *B. rapa* is strongly dependent upon pollinator (primarily honeybee) efficiency to achieve maximum crop yields. As a result, the volume of nectar produced and secreted from floral nectaries is often substantial—up to 100  $\mu$ L per day. Understanding the mechanisms regulating the complex suite of interactions, governing nectar production and secretion, could one day allow for the enhancement of highly desirable traits in agricultural crops. As a first step, we are performing large-scale studies of gene expression in floral nectaries (the organ that produces nectar), and propose to utilize VDIL software for high-throughput DNA sequence analysis.

Before sequencing of *Brassica* flower DNA can occur, it must first be attached to a piece of DNA of previously known sequence (vector DNA). After doing this, one can isolate the recombinant DNA and subject it to sequencing; in our case, samples were sequenced at the University of Minnesota Biomedical Genomics Center. A problem that occurs is that part of the data contains DNA sequence derived from the vector, which, if not edited out, can interfere with DNA sequence analysis. Another common problem is that DNA sequencing generally provides “good” results for only the first 600 nucleotides or so, with downstream sequence tending to be poor. This poor sequence data must also be removed prior to sequence analysis. Thus, the DNASTAR Lasergene software package, specifically Seqman, was used to remove vector sequence and trim off poor sequence data. SeqMan software allows for the designation of minimum length parameters and cutoffs for poor-quality trace data; resul-

tantly, sequence data that do not meet these standards can automatically be discarded. Setting these guidelines prior to analysis of sequence output greatly reduced the time spent processing this information. After trimming off vector DNA and poor sequence data, Genequest software available at VDIL was used to identify what our DNA sequences encode. This software uses the Basic Local Alignment Search Tool (BLAST) to search for similar sequences found in an internationally searchable database. All together, VDIL software was used to analyze results from 576 different sequences.

### Genesis of Rogen moraine in northeastern Minnesota

Margretta Meyer and Prof. Howard Mooers, Geology

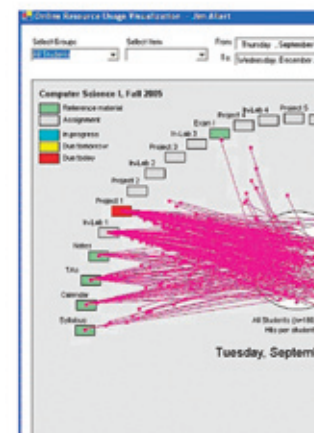
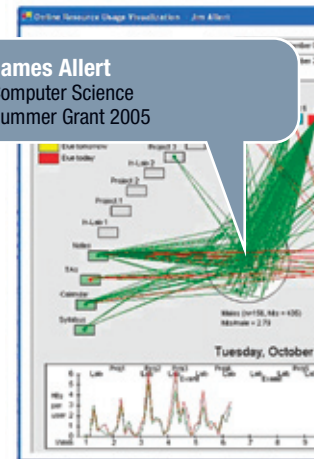
The VDIL at UMD provided an excellent way to explore the Sigma Scan Pro software and learn about the possibilities of spatial analysis for my research. I used VDIL's facilities to download and analyze spatial datasets. Sigma Scan Pro allowed me to trace and determine the area of transverse ribbed landforms, including string and flank topography in bogs, clouds, washboard roads, and my own research into the enigmatic Rogen moraine of northeastern Minnesota. Although I am not sure I can find any connections between the genesis of Rogen moraines and other transverse patterns, I am thankful to the VDIL for helping fund my summer and MS research at UMD!

My Masters research focuses on the genesis of Rogen moraine in northeastern Minnesota. These moraines are a subglacial landform commonly found in the interior lowlands of continental ice sheets in North America and Europe, and consist of parallel ridges transverse to ice flow. These ridges seem to have an interlocking or "jigsaw" pattern and typically range in size from 300-1200m in length, 150-300m in width,

and 10-30m in height. Recent research in Scandinavia proposed that Rogen moraine are essentially "boudinized" till sheets that have fractured due to extensional forces at the base of the ice sheet. During retreat, the transition from a cold-based (ice frozen to bed) to warm-based (ice sliding over bed) basal thermal regime, due to the shrinking of the cold-based area, generates extensional flow. Their hypothesis thus confines Rogen moraine to the interiors of former ice sheets where cold-based conditions were present. There are instances where Rogen moraine do not follow this geographic distribution, such as in northern Minnesota. If Rogen moraine are the result of a boudinage of a pre-existing till sheet, there must be another mechanism to generate extensional flow. We propose that the mechanism for forming the Rogen moraine is due to a change in the ice velocity, not temperature. In NE Minnesota, the Rainy Lobe of the Laurentide Ice Sheet traveled over a transition from bedrock to an area of thick till deposits. Because glaciers travel more slowly over bedrock than sediment, the glacier accelerates at the transition in bed material. This transitional zone is where the Rogen moraine are found.

The work on Rogen moraine in Scandinavia and preliminary results of our work in NE Minnesota suggest that the Rogen moraine is not confined to a particular subglacial temperature regime, but to a dynamic condition. The Rogen pattern is not limited to glacial features. Similar ribbed features perpendicular to flow occur in many natural systems, including clouds perpendicular to air flow, string and flank topography in patterned peatlands perpendicular to groundwater flow, and washboard road, where these patterns are developed perpendicular to "traffic flow."

**James Allert**  
Computer Science  
Summer Grant 2005



**Clay Carter and Brian Kram**  
Biology  
Summer Grant 2006



Figure 1. Summary of grant filling into general categories



**Steve Bardolph**  
Art and Design  
Summer Grant 2005



©2006 Steve Bardolph



---

## INTERDISCIPLINARY COLLABORATION

**The Visualization and Digital Imaging Lab seeks to foster a congenial atmosphere where artists, scientists, musicians and engineers can collaborate on projects, share ideas and learn from each other.**

For example, of his project, “Re-Imaging and Imagining the Beautiful and Sublime,” Steve Bardolph, Art and Design professor writes:

The Visualization and Digital Imaging Lab helped me to realize new ways of visualizing the landscape, and human interactions therein. I have explored large format panoramic photography for years, stretching the traditional rectangular window vertically, horizontally, and across time to capture more of the visual experience.

Because of the unique environment of the VDIL I was able to meet and exchange ideas with colleagues in both the arts and sciences, which led to a fruitful collaboration with mathematician Josh Jacobs. Together we explored mosaics and tiling, using my landscape photography and his extensive knowledge of mathematical concepts and computer science. It was exciting to see my photographs tessellated, additively and multiplicatively tiled in a manner reminiscent of the works of M.C.Escher.

# GRADUATE STUDIES

**The Visualization and Digital Imaging Lab encourages graduate studies and research, particularly in the arts and sciences.** The lab provides a space for collaboration among graduate students in different fields as well as high end equipment for their research unavailable elsewhere in the University. Many students in Computer Sciences, Geology, Chemistry and Mathematics have done the bulk of their research for their theses here in the VDIL. For example, Hans Anderson's Master's Degree in Mathematics and Statistics oral presentation "A music compression/decompression algorithm based on the human ear" (UMD, June 12, 2007) used VDIL audio equipment.

In support of the MFA in Graphic Design Graduate Program, the VDIL has hosted several of the Graduate Reviews (formal presentations twice a year by MFA candidates) in the past two years. Candidates who have presented here include Jennifer Gordon, Hilary Albuquerque, Anthony Rostvold, Neal Peterson, Jill Barle, Heather Haaland, Joshua Hammari, Christina Hoeker, Phil McCollam and Rosie Seymour. They spoke in relation to their Master Thesis topics and showed their design investigations, which they conducted around the semester's seminar theme, such as "Experimental Typography."

Graduate MFA thesis abstracts follow. The majority of work on these theses was completed in the VDIL.

## Jennifer Gordon

*Spirituality in Design: A Global Fusion of Eastern and Western Symbolism*

The human race seeks meaning and often that meaning is found through a sense of spirituality. Spirituality can be associated with a religious or spiritual practice or found in many other forms such as the sense of place. These practices and sensibilities are passed down from generation to generation, from culture to culture and, at times, come to us from somewhere unknown. This sense of spirituality can be studied through a culture's myths and symbols and the relationship people have to those symbols. The basis for Jennifer's work is the concept that people understand their values through the visual culture of their surroundings. With these assumptions in mind, her thesis work explores the many symbolic connections that can be found within all cultures, and more deeply explores those found in two very diverse cultures: Indian Kundalini Yoga and Northern Minnesota. Jennifer's work takes these commonalities and reconfigures them to create a new visual experience that is equally meaningful to either of those specific cultures. If these connections filter through to other cultures, they likely could be spiritually meaningful to many other cultures.

## Anthony Rostvold

*The use of podcast technology and other online visual media in graphic design education*

Recent advancements of Really Simple Syndication (RSS) subscriptions, and the creations of online video content known as podcasting have created accessibility opportunities for students in traditional classroom and web-based education (WBE). The development of a web site to manage podcasts will result in accessible options for WBE in art





**Hans Anderson**  
Mathematics and Statistics  
Summer Grant 2005

and design education. Use of this technology includes: recording of instructional videos, documentaries, classroom lectures, and visiting lectures. This thesis begins with a brief technological overview of podcasting and continues with an exploration and research of visual blogs, and podcasting for graphic design education. The thesis outlines the creation and design of a web interface for managing podcasts for graphic design education, and includes a brief look into re-research opportunities of podcasting in WBE as well as a look at the future of the Internet in academe.

### **Hilary Albuquerque**

#### *Outside/Inside*

As an Indian in America, I realize that I am a part of a minority community. At the same time, I remind myself that I also belong to a much larger community – Immigrants. America is essentially a land of immigrants. Being an immigrant and a minority in this country for over a decade, puts me in an ideal vantage point as I am able to understand America from two distinct perspectives – outside and inside. By outside I refer to the view of America held by Indians living in Mumbai. Inside refers to the perspective of America that I currently hold—one that I have acquired as an Indian from Mumbai living in this country since 1994. Over the years, I have witnessed a gradual increase in the gap between these two perspectives as America has revealed herself to me – and continues to do so.

The word “America” triggers such a diversity of visuals and reactions to individuals from different parts of the globe. Most Indians on the outside have definite opinions about America and the American way of life. Despite the advances

in communication and technology, certain stereotypes and notions of what America must be like have persisted through time. Stereotypes that come to mind include: the land of plenty, the land of the free, no crime, no poverty and freedom of religion. Along with such notions, iconographic images associated with America include: the “Hollywood” sign, the Statue of Liberty, apple pie, Michael Jordan, hamburgers and fries, and so on.

Much of these notions are the result of the way America chooses to present herself to the world. Why does America choose to promote such an image? I believe, the answer to this question will contribute to our understanding of these stereotypes. For to rectify these stereotypes, one must first understand and acknowledge them. Our quest for understanding these stereotypes will lead us to their origin and to the determining factors that have contributed to their persistence through time. This quest will introduce us to the term Orientalism. More specifically, American Orientalism, which refers to the prejudiced depiction of aspects of Eastern cultures (the Orient) by American writers, designers and artists which dates back to the 1800s.

This study, which serves as a social and political commentary on the contemporary American mind-set concerning Orientalism, amid nuanced remnants of colonialism, is a challenging subject that needs further critical examination—one which I believe qualifies as a worthy future research endeavor. I ask myself, who will take up the challenge?

# VIZ LAB PRESENTS

## Fall 2006

### Jefferson Campbell, Music

Live instrumental improvising and composing with Garageband, ProTools and bassoon

### Frank Simmons, ITSS

Keeping Your Computer Healthy

### Clay Carter, Biology

Analysis of Gene Expression in Canola Flowers

### Andrew Larson, Math/Stats

Visualization of Vibration for a Space Truss Structure

### Paul Skalski, Communications

Game Modding

### Tom Wegren, Music

"TRIUMPH" for Wind Ensemble, Piano/Synthesizer Quartet, two Alto Singers and synchronized computer graphics"

### Frank Simmons, ITSS

What is Inside a Computer (Basics)

### Joseph Johnson, Chemistry

Analyzing Potential Protein-Protein Interactions in Alzheimers Disease

### Eun-Kyung Suh, Art & Design

Tangible Memory in Virtual space

### Rachel MaKarrell, Biology

Creating Useful Tools for Learning Insect Anatomy

### Frank Simmons, ITSS

Computer Security

## Spring/Summer 2006

### Frank Simmons, ITSS

Desktop Security: How to Keep your Computer Healthy

### Saiyam Kohli, Computer Science

Visualizing Relations Between Concepts in WordNet

### Harlan Stech, Hans Anderson, Mathematics

The Use of POVRAY for the Visualization of Tree Canopies

### Sandy Pederson, Dar Al Hekma Women's College, Saudi Arabia (blog: <http://blog.lib.umn.edu/lfitzpat/vdil/>)

Teaching Graphic Design in Saudi Arabia

## Fall 2005

### Steve Bardolph, Art & Design

Re-imagining and Imagining the Beautiful and Sublime

### Steve Sternberg, Chemical Engineering

Visualization and Animation of Contaminant Movement in Porous Media

### Josh Jacobs, Graduate Student Math/Stats

Rendering Mathematical Concepts through Visual Media

### Mark Harvey, Theatre

Pursuing the theatrical design attributes of both GarageBand and ProTools

### Rob Wittig, Art & Design

Blending Image and Typography for Digital Scrolls

### Mary Ann Marchel, Education

Assistive Technology for Children and Youth with Disabilities" production of an interactive CD

ITSS Tech Tues @ 2 Flyer  
by Joshua Hammari

AUG 2

Tuesday at 2:00 p.m.:

UMConnect (video conferen  
software, formerly Breeze)

Presenter: Bruce Reeves MPAC



**Margretta Meyer, Graduate Student Geology**  
Genesis of Rogen Moraine; a quantitative spatial analysis

**Kristin Riker-Coleman,  
VDIL RA and Graduate Student in Geology**  
Designing Scientific Posters

**Joseph Beer, Graduate Student, Geology**  
Three-Dimensional Visualization of Late Triassic Landscape  
Evolution of South-Central Utah

**Douglas Dunham, Computer Science**  
Creating a program that will print out 2-dimensional "nets"  
of patterned polygon faces for polyhedra of positive genus,  
which can be folded up and glued together, forming the  
whole polyhedron

**James Allert, Computer Science**  
Visualizations of Student Learning Style Data

**Allen Mensinger / Margot Bergstrom, Biology**  
Digitally tracking movement of an invasive, exotic fish to  
curtail migration into the Great Lakes

---

## ITSS TECH TUESDAYS @ 2

**This series spotlights a variety of technology topics of interest to the university community. It is an opportunity to become aware of what's new and to get supportive ideas and suggestions from your colleagues. The format is an overview or demonstration followed by informal discussion. All sessions are held on Tuesdays at 2:00 pm in the Visualization and Digital Imaging Lab, 154 Marshall Performing**

**14 »** Visualization and Digital Imaging Lab

Arts Center. No registration is required and all UMD faculty, staff, and students are encouraged and welcome to attend.

### Spring 2007 Offerings for the UMD Community

**Shelly McCauley Jugovich ITSS**  
eGradebook

**Bruce Reeves ITSS**  
Breeze Presenter and Breeze Meeting

**Frank Simmons ITSS**  
Keeping Your Computer Healthy

**Shelly McCauley Jugovich ITSS**  
WebCT

**Bruce Reeves ITSS**  
Netfiles

**Chuck Bosell ITSS**  
Telephone Tools for Telecommuting—Desktop Messaging  
and Softphones

**Wendy Zolnowsky ITSS**  
Mail Merge and Tips

**Anthony Rostvold Art & Design / VDIL**  
Podcasting

**Lisa Fitzpatrick ITSS/VDIL**  
InDesign Basics

---

# GAME SYMPOSIUMS

The VDIL together with GRAVEL (Games Research and Virtual Environment Lab)—a group that embraces all campuses of the U of M system—VDIL's Games & Animation Group and the Multimedia Hub sponsored the first Games Symposiums: interdisciplinary, intercampus events, free and open to the public.

The Symposiums showcased gaming technologies and scholarship in an effort to promote and advance understanding of the important new medium of the video game. Presenters included Sandra Voelker, Electronic Arts; Danny Robashkin, Make, Animation and Visual Effects production; Pete Willemsen, UMD Computer Science; Chris Bacigalupo and Harbor City High technology club; Joellyn Rock, UMD Art + Design; Ira "Mimmu" Turunen, UMD Public Relations; and Pete Border, UMTC Physics. Additionally, game demos, and student and faculty game research were featured throughout the day.

---



**Games + Animation Symposium**  
Attendees (photos by Joellyn Rock)  
Flyer by Phil McCollam





Arden Weaver  
School of Fine Arts  
Set design for *Carmen*

---

## DEMOS & WORKSHOPS

### **Vivid 9i non-contact 3D Digitizer by Konica Minolta and Geomagic Studio Reverse engineering software**

June 2005. The digitizer and scanner were demonstrated by First Article Corp [www.firstart.com](http://www.firstart.com), a scanning and reverse engineering provider with expertise in both the software and the hardware.

**Dartfish software** June 2005. James Haugen, Dartfish Regional Director, demonstrated analyzing and tracking motion, particularly in relation to biomechanics and athletics. <http://www.dartfish.com>

**Digital Still Camera Workshop** Aug. 2005. Matt Kinnick, VDIL assistant and senior photography/ Art & Design major and Jennifer Gordon, VDIL lab assistant and MFA graduate student presented on the use and care of still digital cameras and how to take a great shot.

**3D Visualization of Geology & Mineral Deposits** by Dean Peterson, NRRI. Discussion of proposed deep underground science and engineering laboratory Soudan, MN and Duluth complex 3D visualization for University for Seniors.

16 » Visualization and Digital Imaging Lab

**Adobe InDesign Training** Feb. 2006. Keith Gilbert from Adobe led this training. This day-long workshop covered the essentials of Adobe InDesign, a graphic design printing layout software.

**Emerging Technology Tour and Demonstration** April 2006. Lisa Fitzpatrick led this interactive University for Seniors workshop of the many resources available in the lab.

**Animation technique demo and talk** by Kirk Tingblad, Warner Bros. animator Sept. 2006. Kirk Tingblad is an animation artist, director and consultant for Warner Bros. in California. Tingblad created award-winning animation projects such as *Pinky and the Brain* and *Johnny Bravo* cartoons. He also attended UMD.

**Take Our Children to Work Day** Lisa Fitzpatrick, Mary Olson-Reed (Multimedia Hub) April 2007. Children's workshop on multimedia production: using a dv camera, editing, effects, transitions and sound.

**Over ten Undergraduate Research Opportunities Projects** in 2006-2007 were associated with the VDIL, including Patrick Levno, SFA, "Pigman;" Paul Bushey, CSE, "Intelligent Ground Vehicle Competition Project;" Alexandra Erickson and Tyler Malay, SFA, "Experimental Techniques in Digital Video;" Danielle Nelson, SFA, "Metamorphosis of Peace: Paintings by Francisco da Costa Maya;" Leah Niemand, CSE, "Bioabsorption of Copper using Lemna Minor;" Rachel Novek, SFA, "Factor Group Transformations in Art;" and Joseph Ricasio, CSE, "Classifying Heart Murmurs though an Intelligent Stethoscope."

# EXHIBITS PERFORMANCES CONFERENCES & PUBLICATIONS

**Bill Payne**, Director. Video scenery with Karen Hoffman for *Julius Caesar* by William Shakespeare. UMD Theatre Production April 2006.

**Bill Payne**, Director. *50/50: The American Divide*. A documentary about voting shot during the 2004 election Premiered in Duluth February, 2007 - Minneapolis (at the Humphrey Institute March 2007).

**Bill Payne**, Director. Pathways to Understanding: Raising Children with Fetal Alcohol Spectrum Disorder: A Seminar with John Hays. Premiered in Duluth October 2005. National distribution of DVD.

**Karen Hoffman**, Scenic Designer. Video scenery. *Pulse Points* UMD Dance Concert, February 2006

Poster presentations using layout designed in collaboration with SFA Faculty at the VDIL.:

**E.T. Brown, and T.C. Johnson**, "Initial XRF results from the Lake Malawi sedimentary record" GSA Abstracts with Programs 38(7) 2006 Annual Meeting Philadelphia, October 2006. Paper No. 28-19.

**E.T. Brown, T.C. Johnson, C.A.** Scholz, J.E. King and A.S. Cohen "D-O Events in the Southern Tropics of East Africa? Initial XRF Results From the

Lake Malawi Drilling Project" Eos Trans. AGU, 87(52), 2006. Fall Meeting, San Francisco, December, 2006 Abstract PP13A-1587

**E.T. Brown**, "Twentieth Century ground-truthing of Lake Malawi climate proxies" Eos. Trans. American Geophysical Union, 86(52), 2005 Fall Meeting, San Francisco, December 2005, Abstract PP21A-1548

**Janice D. Kmetz** In May to August 2006 I exhibited two pieces printed in the VDIL, "Widow's Weed's" digitally printed fabric assembled into a coat, and "without/within" 18 x 40" digital print. Juried exhibition at the Minneapolis Foundation IDS Center, Minneapolis.

**Janice D. Kmetz** 2007 exhibited in Tweed UMD faculty show, 60 x 22 inch digital print part of installation titled "bout my lover boy"

**Eleanor Hannah** VDIL resources were used to create a catalog for the Richard I. Bong World War II Heritage Center, October 2005-September 2006, and also a program brochure for the 42nd Annual Northern Great Plains History Conference, October 3-6, 2007

**Catherine Ishino** Department of Graphic Design, presentation on "Social Design/Designer as Citizen" at the Central Academy of Fine Arts in Beijing February 2007. Showed the '3 Generations of Chinese Designers' DVD that I authored in the VDIL on DVD Studio Pro software. I also showed my 'Internment' projects-installation, DVD, show, which I created at the VDIL. Also showed "Get out the Vote" student social design work.



## Fighting Dollars

Catalog for the Richard I. Bong WW II Heritage Center by Eleanor Hannah



**Catherine Ishino** "Seeing Is Believing: Reflections on Video Oral Histories with Chinese Graphic Designers" *Journal of Design History* Vol. 19 No. 4

**Catherine Ishino** was invited to submit her motion graphics syllabus for publication in an upcoming design book, "Teaching Motion Design." The editors are Steven Heller and Michael Dooley. (Ishino's capstone Senior Design Class, "Get Out the Vote" project, is already published in the second edition of a companion book.)

**Robert Appleton's** artist's monograph "Insight", which was designed in the VDIL during summer 2006, is being published in Beijing through The China Central Academy of Fine Arts, where he recently completed a year as CAFA Visiting Professor. (in press)

**Steve Bardolph** I used VDIL resources to help produce three archival inkjet photographs (*Orange Hawkweed, Lighthouse Honeycomb, and Planet Fitger's*) for the UMD Art + Design Faculty Biennial, March 20-May 13, 2007. Details and an image at:  
<http://www.d.umn.edu/tma/exhibitions/07faculty.html>

Directors and Producers **Sarah Bauer, Jen Dietrich** and **Althea Wasow** presented at the Independent Feature Project (IFP) Film Market Work in Progress Screening, Thursday, September 21, 2006, 9:45 a.m. Angelika Film Center, Theatre 2, 18 W. Houston St. New York, NY. *Not Made in Heaven* explores the myth of the artist through the cool, provocative, controlled, and quietly influential world of painter Philip Pearlstein.  
<http://notmadeinheaven.ubfilms.com>

**Catherine Ishino**  
Art and Design, Presentation at the  
Central Academy of Fine Arts, Beijing

**Roger Hanna**, Guest Scenic Designer. *Kiss Me, Kate*. UMD Theatre production October 2005

**Rob Wittig** The two works of mine that were in the Faculty Show in the Tweed Museum of Art, March 20 - May 13, 2007, were done in the Viz Lab. I wish to thank Lisa and the Viz Lab for their consistent support of faculty creative research.

**Josh Hammari** I designed a 84-page typographic book for fall semester, printed a 2x3' poster (which was accepted into the spring Student Exhibition and won a Art + Design purchase award) and cut vinyl graphics this spring for Carsonite trail signs now installed at Bagley Nature Area--all in the VDIL.

**Scott E. McKay, Robert W. Lashlee III, Bryce A. Holthouse, Paul Kiprof:** "A computational study of sulfur bridged cyclooctatetraenophanes" *Journal of Molecular Graphics and Modelling* 25 (2006) 543-548

**Paul Kiprof, Stephen R. Miller, Melissa A. Frank:** "Theoretical investigation of sulfur and halogen-substituted carbocations," *Journal of Molecular Structure: THEOCHEM* 764 (2006) 61-67

**Paul Kiprof, Carl N. Sandness, Anthony J. LePine, Jason A. Kallestad, Alexey Y. Koposov, Victor G. Young Jr.** "High-valent transition metal arene complexes: Investigation of the mesitylene complex of TiCl<sub>4</sub>" *Inorganica Chimica Acta* 539 (2006) 4847-4850

**Imran A. Zualkernan, James Allert, Ghassan Z. Qadah**

"Learning Styles of Computer Programming Students: A Middle Eastern and American Comparison" IEEE Transactions on Education, Vol. 49, No. 4, November 2006

**Cecilia Ramón** Dia de Muertos en El Colegio, Buenos Aires, Argentina in November 2005

**Michael P. Callahan and Allen F. Mensinger**

Restoration of visual function following optic nerve regeneration in bluegill (*Lepomis macrochirus*) × pumpkinseed (*Lepomis gibbosus*) hybrid sunfish. 2007 Visual Neuroscience (In press)

**Jean R. Perrault** Documenting performances of opera "Cosi Fan Tutti" from the Sieur Duluth Summer Arts Festival, Summer 2006.

**Jean R. Perrault** "7th Annual Story-Hour Concert Pictures..." Nov. 2006. Projections of over 300 scanned images by Grant Elementary School students in multimedia presentation by UMD Symphony Orchestra, including Mussorgsky's "Pictures at an Exhibition." Produced in VDIL.

**Jean R. Perrault, director** "Homage à Mozart" UMD Chamber Orchestra. Weber Music Hall December, 2006. Compiled and produced DVD using VDIL equipment.

**Jean R. Perrault** Symphony Orchestra. Sounds of the Season. Dec. 2006. Compiled and produced DVD using VDIL equipment.

**Jean R. Perrault** U-3 in Concert. Jean R. Perrault, violin; Betsy Husby, cello; and Jeanne Doty, piano, compositions

by Brahms, Kodály, Haydn, and Händel-Halvorsen. February 2007. DVD produced in VDIL.

**Jean R. Perrault, Pierre Calmelet, Guest Conductor,** Symphony Orchestra: 6th Annual Student Concerto Competition Concert March 2007. Compiled and produced DVD using VDIL equipment.

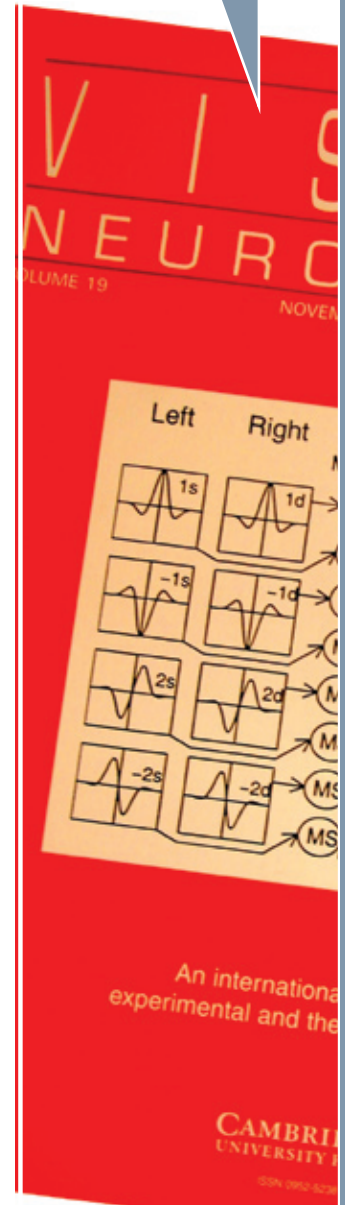
**Jean R. Perrault** Chamber Orchestra Spring Concert "The Four Seasons" April 2007. Compiled and produced DVD using VDIL equipment.

**Jean R. Perrault, Stanley R. Wold directors. Erol Erdinç,** guest director. Turkish-American Alliance Masterworks Concert. University Singers, Chamber Singers, Concert Chorale, and UMD Symphony Orchestra, along with Turkish guest orchestra Hacetepe Symphony Orchestra, spotlight Turkish and American music. May, 2007. DVD produced in VDIL.

**Eun-Kyung Suh,** "Naturally Inspired" January 12-February 16, 2007, Inez Greenberg Gallery, Bloomington, MN

**Eun-Kyung Suh,** "Yellow Ribbon 1" Best of show. *Works on Paper* – National Juried Show, Bancroft Gallery, South Shore Art Center, Cohasset, MA, January 12-February 25, 2007

**Russeth, K. P., Higgins, L. & Andrews, M. T.** Identification of Proteins from Non-model Organisms Using Mass Spectrometry: Application to a Hibernating Mammal. *J Proteome Res* 5, 829-39 (2006).





**Justin Rubin**, “La Zarabanda”-abstract film produced in VDIL. Visual Music Marathon April 28, 2007, Northeastern University, Boston, MA Over 300 works from 33 countries were submitted to the Marathon. Of these, 64, representing 6 hours of programming, were selected for screening. [www.music.neu.edu/vmm](http://www.music.neu.edu/vmm)

**Lisa Fitzpatrick, Melissa Jokela** (VDIL/ITSS) presented on “Designing a Touchscreen Info Kiosk with Flash” at the Flashbelt Conference, Minneapolis, MN. ([www.flashbelt.com](http://www.flashbelt.com)) June 2007. This international, industry-related conference brings together flash designers, developers and enthusiasts, such as Seb Lee-Delisle (<http://www.pluginmedia.net/>), GMUNK, Jeremy Thorp (<http://www.blprnt.com/>) and Richard Galvin from Adobe (<http://www.adobe.com/flash>)

---

## VIZ LAB STAFF & ALUMNI BLOG

**The Visualization and Digital Imaging Laboratory is staffed by the coordinator, Lisa Fitzpatrick, as well as two half-time Graduate Research Assistants (2005-2006 Jen Gordon, Art + Design, Kristin Riker-Coleman, Geology, and Mahesh Joshi, Computer Science; 2006-2007 Anthony Rostvold, Phil McCollam, Art + Design and Andrew Larson Mathematics & Statistics) and one part-time undergradu-**

ate student (2005-2007 Alexandra Erickson, who designed the new wordmark). Through the years the lab has also had numerous student volunteers who come to the lab for the love of learning, and student employees for special projects. The Games & Animation Group (GAG) is a VDIL club which experiments with animation, 3D modeling and games. VDIL students are the cream of the crop; upon graduation they move on to successful careers or graduate study. The lab’s blog “A Confluence of VDIL Researchers” <http://blog.lib.umn.edu/lfitzpat/vdil/> helps researchers and alumni to stay in touch and exchange insight and ideas.

information compiled by Lisa Fitzpatrick  
report designed by Joshua Hammari

VISUALIZATION  
& DIGITAL  
IMAGING LAB  
'05-'07  

---

BIANNUAL  
REPORT



*Reaching  
higher*

The University of Minnesota is an equal opportunity educator and employer.