

# Integrating Writing and Computer Graphics to Improve Technical Communication Across Disciplines

Daniel Keefe, Assistant Professor

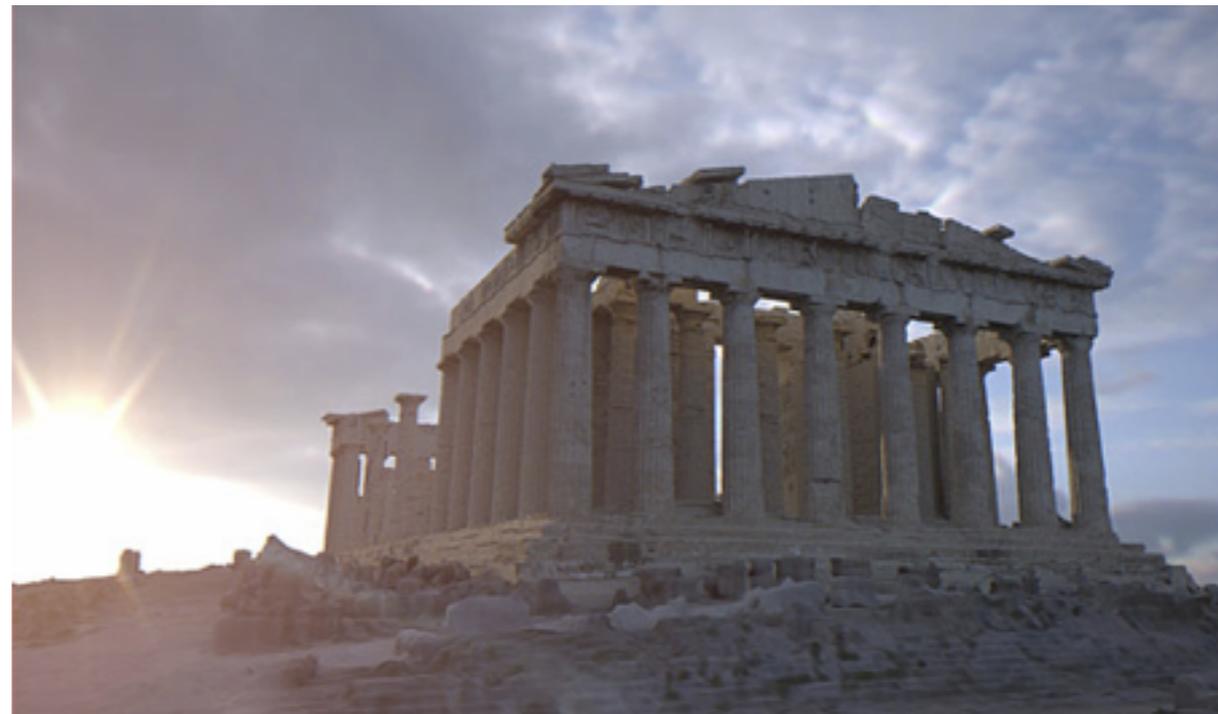
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# Computer Graphics

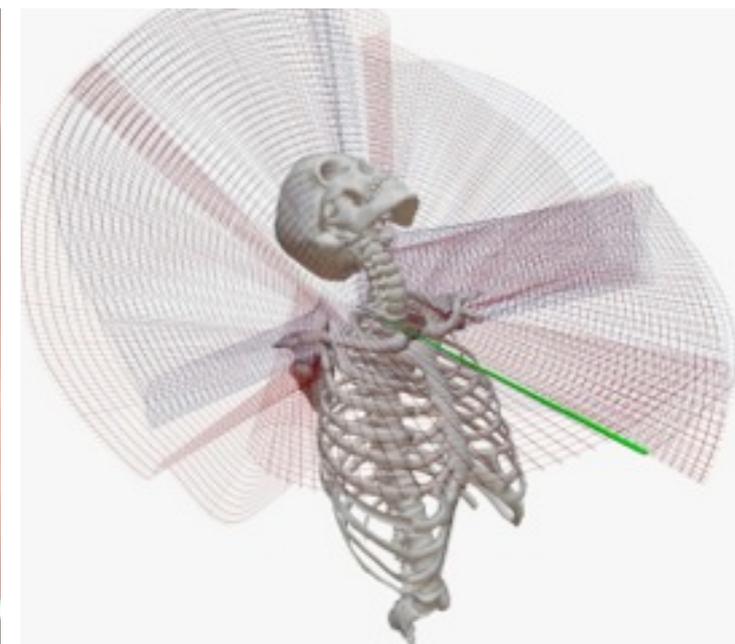
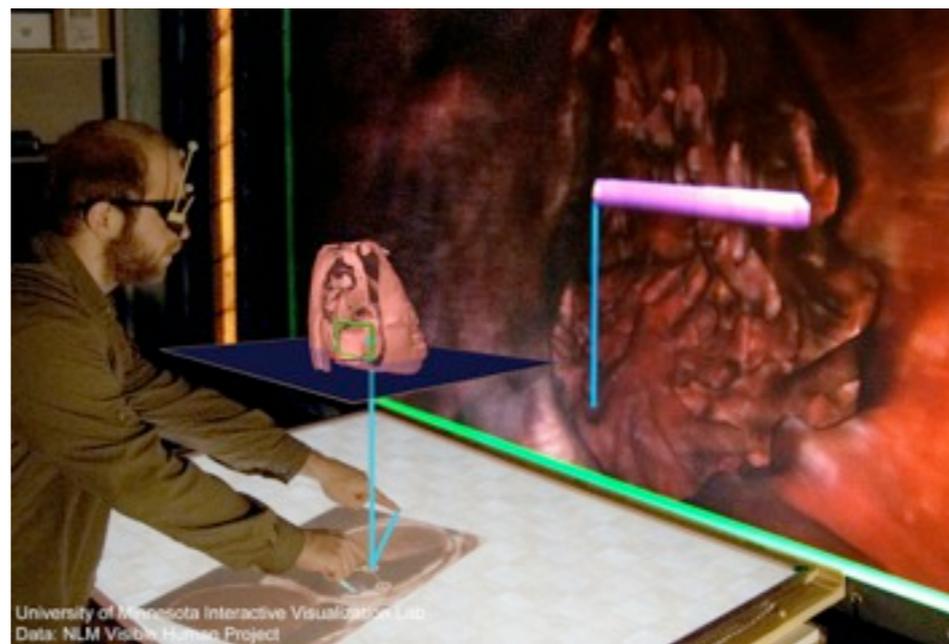


(Geri's Game, Pixar 1998)



(Debevic et al. 2004)

(ivlab.cs.umn.edu)



# Possible Career Paths for Students

- Movies (e.g., Pixar)
- Computer Games
- Surgical simulators for training
- Data visualization (biology, chemistry, engineering, ...)
- Amazon.com, Oracle, Medtronic, Microsoft, Intel, Nokia, Tech. Startups

# Research question

To what extent can *reinterpreting and supporting* important modes of communication in our field (e.g., posters, talks, demos) as important forms of *writing* improve students' abilities to communicate with broad interdisciplinary audiences?

# Outline

- Key types of writing in computer science
- Current writing support
- Re-envisioned role of writing
- Writing in Computer Graphics Wiki and other efforts to engage with writing
- Future work

# Types of writing in Computer Science

- Papers.
- Documentation, Websites, Technical Emails, Code.
- Especially important for Computer Graphics:
  - Communicating with reference to imagery.
  - Communicating across disciplines.
  - Papers with AWESOME figures, Posters, Videos, Talks, Demos.

# Posters

## A DESIGNER'S APPROACH TO SCIENTIFIC VISUALIZATION: VISUAL STRATEGIES FOR ILLUSTRATING MOTION DATASETS

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**ABSTRACT**  
 This is a case study incorporating the process of ideation of an experienced graphic designer into the workflow of a team of programmers to improve scientific visualization methods. This work highlights the current opportunities and reports on the process adopted for beneficial collaboration between designers, computer scientists, and other collaborators. The specific design problem that is addressed is creating illustrative visualization rendering algorithms for describing complex motion data, such as those analyzed in studies of human biomechanics.

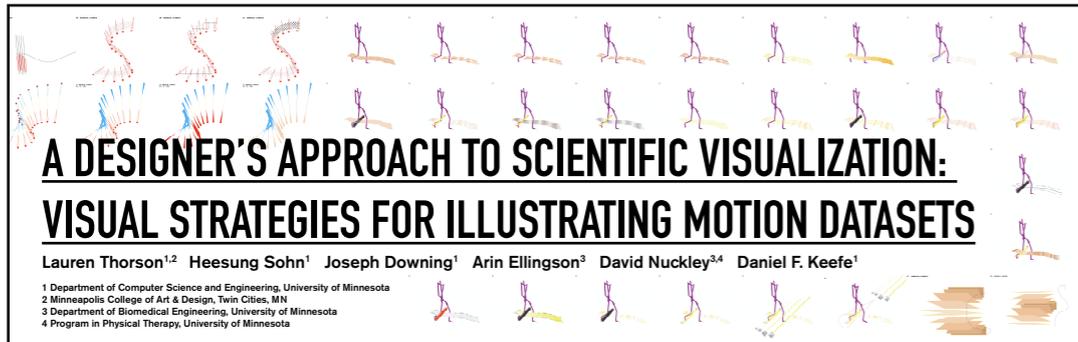
**PROCESS OF IDEATION**

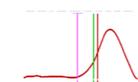
1. Introductory session to specific problem
2. Questions & areas of interest clarified for designer
3. Designer uses current visualizations as reference for alternate strategies
4. Designer uses Adobe Illustrator to produce as many viable graphic solutions, ideas, sketches to the problem as possible (weekly average 63 sketches)
5. Group critiques sketches and determines one example sketch that would be interesting to explore
6. With a very clear visual specification, the programmers are able to implement the idea within a few days

The designer's role in this process is to create an abundance of visual imagery, to spark conversation, inspire solutions, and identify positive and negative visual representations. This design process saves countless hours of programming, while still being able to produce conversations and achieve visual representations that can be critiqued for the specific dataset. After an introductory session to a specific problem, in this case the axis of rotation of the knee joint (fig. 1), a conversation including many questions and areas of interest are clarified for the designer. Current visualizations that have been created (fig. 1) are given to the designer to use as reference when creating alternate strategies.

From the information collected, the designer uses the knowledge in graphic communication as a whole to create as many 2D graphic visualizations as s/he finds applicable to the problem. The illustrations were developed using Adobe Illustrator, averaging about 63 illustrations a week to be critiqued. This is along with compiled visual imagery, to be shown as inspiration to the team, in solving similar visual problems. This quantity of visual inspiration excessively speeds up and gives variety to the process of visualizing the scientific dataset. Thus, we have found that the most radical change from our more traditional design processes is the speed at which the designer can create (so that we may all discuss and critique) many illustrations (e.g., fig 1), without having to wait for an idea to be programmed.

Fig. 2 shows one example sketch that we determined would be interesting to explore. With this very clear visual specification set out on paper in front of them, the programmers on the team were able to implement the idea within a few days, connecting it to the underlying dataset to create the animated visualization shown in Fig. 3. Reducing the timeframe of ideation to development to about a week, compared to the multiple months reported previously.







## An Application for Analyzing Stone Tool Artifacts

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**INTRODUCTION**

**Problem**  
 The analysis of lithic stone morphology has been largely qualitative in nature. Recent advances in graphics and scanning technologies are enabling a more quantitative approach to analyzing these artifacts. A 3D digital model of a stone artifact created from laser scans can be measured using metrics such as Ricci curvature, Gaussian curvature, etc. to support archaeological analysis of the points and direction of flake scars, although it does have some difficulty to identify flake scars themselves.

**Our goal** is to create a tool that enables the anthropologist to efficiently perform a certain quantitative analysis of stone tools.

**Background**

Types of stone artifacts  
 • **Flakes** are pieces of stone that are removed from a block and may be used for hunting and armory.  
 • **Core** is the larger stone from which flakes are chipped off.  
 • **Flake scars** are the depression formed when a flake is removed.  
 • **Flake scars** allow a **stripping pattern** emerging from the point where the core was struck.  
 • **Blunt of percussion** The base of the interior of a flake often has a ledge that is the dorsal part of the flake.  
 • The pattern of flake scars gives some clue to how these tools were created (different sites).

**Motivation**  
 The quantitative geometric measurements obtained from our tool will allow researchers to analyze stone tool variation in a manner previously unavailable. Using a quantitative approach to the traditional method of a categorical variable, we hope to explore in more precise detail the nature of lithic stone variation as it relates to spatial and temporal variation, and thereby enable behavioral variation.

**Our tool** supports interactive labeling of flake scars and performs quantitative analysis of the scar pattern as described in [Barkun et al.].

**IMPLEMENTATION**

**Interactive Labeling**  
 RicciCurv is used to align the laser scans and export a model that our application can load and write.

**Interaction with Keyboard and Mouse**  
 • Rotate and translate the model using the mouse.  
 • Create a new set of labels for a specific flake using a left-click with the mouse.  
 • Click inside the point of impact for the flake scar, drag the mouse to the direction the flake was struck, and then release at the opposite edge of the scar.  
 • The label is transformed from 2D screen space to 3D model space by rotating it to face the direction through the endpoints of the arrow in the image plane pointing where the flake impacted with the model.  
 • An arrow glyph is generated on the model by projecting the vertices of the model to the plane of the arrow and rotating those vertices that fall within the bounds of the arrow.

**Automatic Segmentation of Flake Scars**  
 Figure 1. 3D laser scans of a yellow flake loaded in RicciCurv software. Figure shows the stripping pattern on the surface of the flake. Flakes identified as white the flake is striped off from the core. Edge near the flake is the Blunt of Percussion.

**Maximum curvature of the surface with smoothed normals. Edges are highlighted in yellow.**  
 Figure 2. 3D model of a yellow core obtained from laser scan.

**Interactively placed arrows to show direction of flake removal.**  
 Figure 3. Maximum curvature of the surface with smoothed normals. Edges are highlighted in yellow.

**Automatic segmentation of flake scars.**  
 Figure 4. Automatic segmentation of flake scars.

**Interactively placed arrows to show direction of flake removal.**  
 Figure 5. Interactively placed arrows to show direction of flake removal.

**Automatic Edge Segmentation**  
 First scans may have many flake scars, so to alleviate the burden of labeling them, we have attempted to create an automatic labeling system.

• Curvature and distance elements of the surface are computed.  
 • Edges are identified as a maximal gradient of RicciCurv method is used.  
 • Our maximum curvature edges in 3D junctions more readily with smooth edges. Possible flake scars are identified by segmenting regions of low curvature.  
 • The algorithm connects contiguous sets of triangles that do not contain edges.

**Automatic Labeling**  
 Task is to identify the directions in which the flakes were struck off all the scars.

• Remove edges generate hundreds of tiny regions in addition to a few large ones, so the following steps occur on the 2D image regions.  
 • Create 1000 points at random from a region and then fit a surface to it using non-linear optimization.  
 • The best surface can then be found for a smoothed surface.  
 1. Find the bounding sphere of the 1000 sample points.  
 2. Choose a diameter of the sphere.  
 3. Select a point along the diameter.  
 • The sum of squared errors between the surface and the sample points is minimized by optimizing 5 parameters, but to determine which diameter of the sphere is used and then to describe the position.  
 • The diameter is used to label the direction in which the flake was struck. The parameter which minimizes the diameter is the same point by computing, at each endpoint, a distance-weighted average of the sample points' coordinates.  
 • Based on our observations of the results, we assume that the flake was struck off in the more closely curved edge. Our algorithm iteratively re-evaluates results, but these labels may be interactively edited or deleted just as one would a flake scar.

**SUMMARY AND FUTURE WORK**

**Our contribution**  
 • A prototype tool for labeling and analyzing flake scars on 3D scans.  
 • Limited success at identifying and labeling flake scars automatically.

**Future work**  
 Physical understanding of how flake fractures (for example, pattern of concentric ripples that form around the point of impact) will greatly help in automatic identification of scar labels.

Processing the artifacts quickly through existing the feature set and marking new interactions.  
 Improving the surface feature detection and give the user more flexibility in marking and adding annotations.  
 Improving flake scar identification using a function that more clearly matches the shape of flake scars.  
 Including techniques that involve user interaction with automated analysis, some partial classification of surface features is currently in "rough work" and the tool allow the user to guide the edge-detecting algorithm to the regions of interest.

## Teaching Science in Virtual Reality with a Freehand 3D Illustration

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**Index Terms** VR, 3D (Computer and Education), Computer User in Education—Computer-assisted instruction (CAI), 3D (Computer Graphics), Three-dimensional graphics and Realistic Virtual Reality.

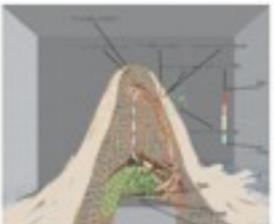
**Keywords** Visualization, feature-computer interaction, virtual reality, non-glyphometric rendering, illustration, education, teaching.

**1. INTRODUCTION**  
 We present the design of an immersive virtual reality (VR) environment and its use in teaching a biology lesson on the active structure of a terraced mound. Educators at all levels and illustrators in textbooks and lectures to enhance students' comprehension of new information because they present material in an intuitive and interesting fashion [2]. Computer graphics has a rich history of application in conveying information to lecture audiences, including the early use of VR in architectural prototyping, walkthrough [1] and the interactive, 3D educational illustrations of the human eye in this paper [3]. Our freehand 3D model would combine the advantages of VR and non-glyphometric rendering to effectively communicate a difficult scientific concept and engage upon the traditional mode of instruction through projects.

The second contribution by the non-glyphometric rendering is to allow VR to be a fascinating example of artificial systems, natural regulation to animals. A clear communication two students will performed with virtual pet characters, in three-dimensional space provides reorganization and waste gas exchange for the use at its base [6]. This structure and its interaction with the environment can be difficult to convey in text and 2D illustrations. We used CamPaint [8], a freehand modeling program that runs in the CAI's virtual reality environment [3], to design a simple, non-glyphometric concept model of the mound that includes communication context and gas exchange. Since the model was intended to be used for instruction, its design and the design of the accompanying lecture presented in parallel. These tasks were complete, a view of undergraduate biology students was brought into the CAI, in groups of six to eight for 15-min lecture lessons.

**2. PRESENTATION**  
 As the students entered the virtual environment, they saw in front of them a life-size model of a terraced mound, to peak just higher than their heads. Many viewers can see in the CAI's environment their views are all controlled by simple use. The lecture hall this model had been set up to reveal the rest of the mound, but a section had been cut away to reveal the rest of the mound and the air elements.

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## MEDICAL DEVICE INVENTION AND EVALUATION THROUGH SIMULATION, VISUALIZATION, AND INTERACTIVE DESIGN

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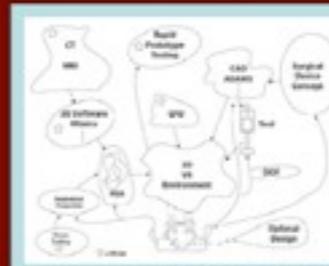
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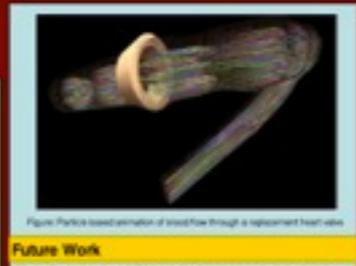
**Introduction**  
 The current medical device design process has the potential to be significantly improved through the introduction of transformative computational tools and processes. An integrated approach to cyber-design, experimentation, and iterative visualization can enable designers to gain new knowledge of optimal device configurations and deployment strategies, design more complex devices, and reduce time-to-market.

**Methods**  
 Supercomputers were used to simulate fluid flow of blood through a replacement heart valve. The virtual environment and visualization were implemented in two VR setups. First, a full-scale virtual environment was located at the Minnesota Supercomputing Center (MSC) and a large stereo display coupled with a multi-touch table. We have begun to investigate how this second setup can be used to interact and navigate through the virtual environment and visualization. Using the virtual stereo surfaces we render the flow animation, while the horizontal multi-touch surface renders the shadow of the virtual geometry. Multi-touch gestures were used to rotate, scale, and translate the geometry to a 3-dimensional navigation of the flow animation.

**Results**  
 The particle based visual output provided a good initial understanding of the unique flow characteristics during heart valve simulation. This included the large velocity differential of the flow through the leaflet valve cycle. The results indicate a successful integration of the multi-touch and multi-stereo visualization environment that includes multi-touch navigation around the flow. We anticipate that the results have great potential as an interactive tool to explore the complex data necessary for medical device development and fabrication.

**Background - Current Work**  
 Medical device researchers seek to better understand the complexities of cardiac anatomy, evaluate how surrounding structures affect device function, and ultimately design more effective devices. Virtual representation combines visual fidelity, virtual reality applications, finite element analysis based on the architecture of a 3D model created from Magnetic Resonance Imaging (MRI) or Computer Tomography (CT) scans, and computational fluid dynamic simulators of blood flow. The virtual model and data is visualized and experienced in a virtual reality environment to enhance understanding of the complexities and difficulties of real medical device development.



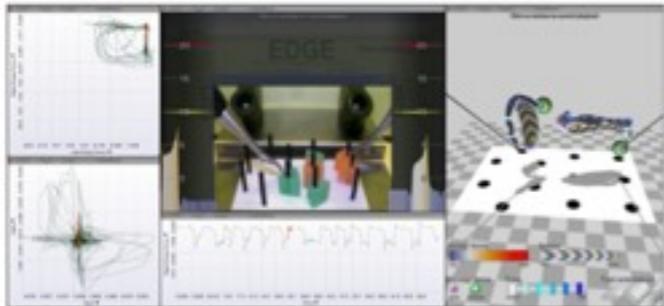



# Papers

### Visualizing Surgical Training Databases: Exploratory Visualization, Data Modeling, and Formative Feedback for Improving Skill Acquisition

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Eran Simeon<sup>5</sup>, Robert Swint<sup>6</sup>, Thomas S. Landrey<sup>7</sup>, Troy Rathen<sup>8</sup>, Daniel F. Kaelin<sup>9</sup>

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<sup>4</sup>SimPORTAL, Simulation Peri-Operative Resource for Training And Learning (University of Minnesota Medical School)  
<sup>5</sup>University of Washington Department of Urology & Robotic Surgery Center, Seattle Children's Hospital



**Figure 1:** An interactive visualization application for exploring multidimensional data collected during laparoscopic surgical training exercises. 2D data plots support analysis and data filtering. Fibers augmented with data overlays provide contextual information required to interpret trends, and 3D visualizations support analysis of multivariate and path data within a spatial context.

**Abstract**  
 We present a design study and application of visualization to analyzing multidimensional surgical performance databases collected via emerging surgical robot and simulator technologies. The application visualizes form, position, rotation, and synchronized video data from 300 binocular laparoscopic surgery tasks performed by more than 50 surgeons. We introduce the design of a new multiple coordinated views framework for exploring these data, along with novel techniques for selecting and filtering multivariate time series data, visualizing associated force plots in conjunction with contextual videos, encoding multivariate binocular tool trace data within 3D visualizations, and linking visualizations to a database management system via a new generalizable data model. Insights and feedback from an interdisciplinary iterative design process and user studies are discussed in detail. The long-term goal of the research is to understand how to leverage visualization to support a new paradigm of objective measurements of surgical skill and data-driven surgical training.

**1. Introduction**  
 Minimally invasive surgical techniques, such as laparoscopic surgery, typically offer important benefits to patients relative to open surgery. Unfortunately, the psychomotor and cognitive skills that must be mastered to become proficient at laparoscopic surgery remain extremely challenging to learn and to teach. In addition, objective means of measuring surgical performance have been limited to summary, one-dimensional data such as task time or total errors, making it difficult to evaluate and provide feedback to surgeons. The advent of new technologies (e.g., robotic surgical instruments, computer simulators, computer vision algorithms) has created an opportunity to record multidimensional data including tool

KEEPS ET AL.: DRAWING ON AIR INPUT TECHNIQUES FOR CONTROLLED 3D LINE ILLUSTRATION 1271



**Fig. 4:** A custom elastic controller is mounted on a second pen attached to the side of the Phantom stylus. For 3D drawing, control and angle of unit motion is improved by forcing the stylus with the index finger as an outer force is applied. In this position, the index finger is properly positioned to apply pressure to deform the spring-loaded hinge, as shown in the diagram on the right.

Seemed to the stylus of the Phantom. As more force is applied and the hinge deflects, the width of the mark is expanded and the color is adjusted to create a heavier 3D line. Releasing the spring device makes a thinner line.

Colors are interpolated from a gradient selected by the user. Artists often input their own color palettes and adjust the gradients to increase contrast with the background color as pressure increases.

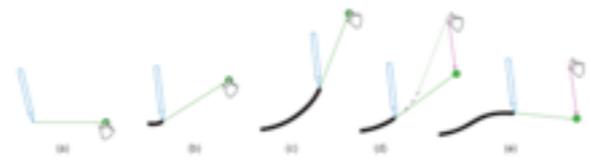
As in traditional artistic tools and other pressure-based interfaces [18], visual feedback is important for control. The width of the curve geometry and a pressure meter drawn to the right of the brush model provide continuous visual indications of the current line weight.

**3.2 Two-Handed Tape Drawing**  
 Drawing a curve with the two-handed tape drawing interface requires coordinated movement of both hands, as depicted in Fig. 5. Throughout the interaction, the tape drawing tangent or drawing direction  $\vec{d}$  is updated based on the last sample of the curve  $\vec{c}_i$ , and the latest tracker reading for the hand  $\vec{h}_i$ :

$$\vec{d} = \begin{cases} \vec{h}_i - \vec{c}_i & \text{if } i = 0 \\ \vec{h}_i - \vec{c}_i & \text{if } i > 0. \end{cases} \quad (6)$$

For the initial case, the stylus location is used instead of the last curve sample.

The brush is advanced along the drawing direction by movement of the stylus:

$$\vec{h}_i = \text{projection of } \vec{c}_i \text{ onto the line segment } (\vec{c}_i, \vec{h}_i - \vec{c}_i). \quad (7)$$


**Fig. 5:** The progression of a Drawing on Air tape mode interaction for a two-handed user. The drawing direction is determined by the position of the hand and the endpoint of the curve being drawn. To draw a curved path, both hands must move together (a) through (c). As the user backs up to retrace a portion of the curve (d), a virtual offset (shown as a magenta vector) is applied to the hand position so that a tangent preserving transition is made when forward drawing resumes (e).

Straight lines can be easily drawn by holding the nondominant hand in place and moving the stylus directly along the tangent line. To draw a curve, the nondominant hand is moved while drawing to dynamically change the tangent as the dominant hand advances along the tangent, as we see in Fig. 5 from position a (Fig. 5a) to e (Fig. 5e). The artist can stop his dominant hand at any point and make a drastic change in the curve tangent before proceeding to create jagged or bumpy lines.

Force feedback in the form of a dynamic line constraint is used to constrain the stylus tip to remain on the line segment connecting the two hands. This helps the user concentrate on specifying the drawing direction and advancing deliberately along this tangent rather than concentrating too heavily on the 3D position of the dominant hand.

It is unclear whether a consistent preference exists for the role of each hand in tape drawing. Traditionally, 2D tape drawings draw from left to right, regardless of handedness. In this 3D interaction, artists seem to be more comfortable drawing toward the nondominant hand, so the dominant hand can play the key role in adjusting line weight via haptic interaction, as described below.

**3.2.1 Varying Line Weight**  
 The haptic line constraint provides a control for varying line weight that mimics physical media. Just as a brush or a piece of charcoal is pushed against the paper to make a dark, thick line, users push against this line constraint to change the weight of the mark. The pressure from this interaction,  $p_{haptic}$ , is combined with the pressure from the elastic finger controller,  $p_{elastic}$ , to produce a total value for the line weight of the mark:

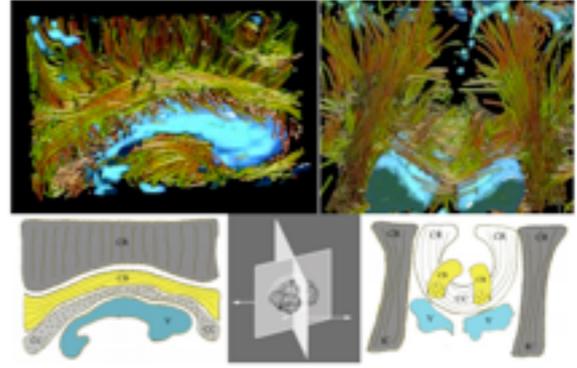
$$w = p_{haptic} + p_{elastic} \rightarrow p_{total} \quad (8)$$

This value is used to adjust the color and width of the mark being drawn.

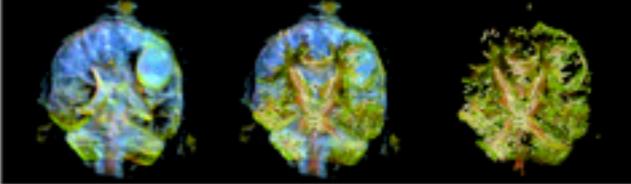
As the user pushes against the haptic constraint, the position of the stylus physically moves off the line constraint somewhat. In fact, the distance that it moves off the line serves as our measure for  $p_{haptic}$  but its virtual position is constrained in software to remain precisely on the tangent line so that a smooth curve is drawn.

**3.2.2 Haptic-Aided Curve Redrawing**  
 As with drag drawing, we extend the basic tape drawing interaction to support backing up and redrawing the mark. Bakshian et al.'s 2D tape drawing [4] included a similar

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**Fig. 1:** Interactive renderings of a human brain from below. The renderings show affections of fibrous axons with major white-matter tracts. Components of the anatomical data control: fibrous direction, color, and density as described in the text. Other volume rendering simultaneously shows the ventricles (labeled V) in blue for anatomical context.



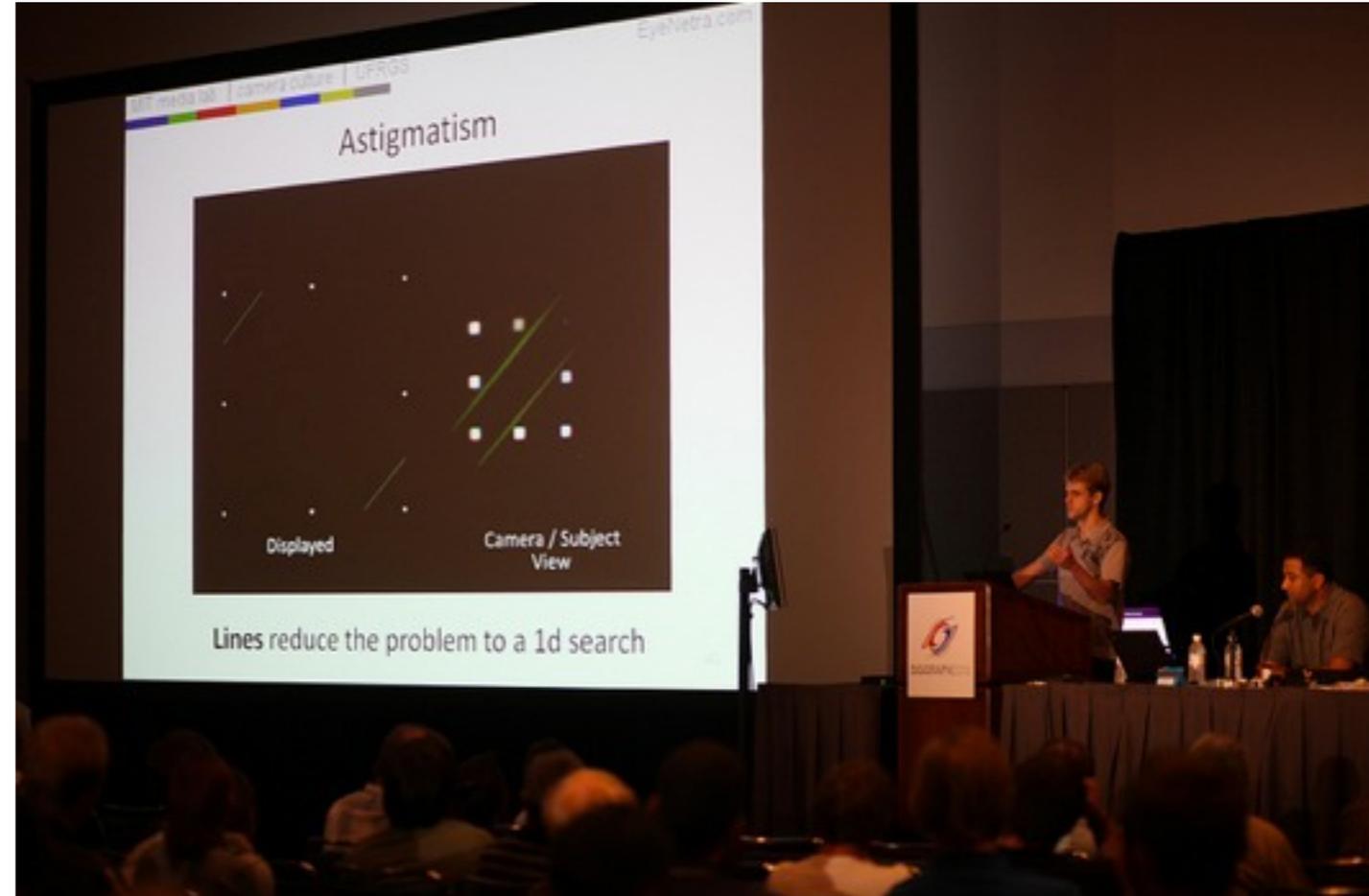
**Fig. 2:** Left: A three-dimensional rendered tape drawing region with different diffusion anisotropies. Right: A three-dimensional rendered tape drawing both the anisotropy and diffusion direction. The two layers are combined in the same image which shows right clearly more information and requires little additional visual bandwidth.

paths along the principle eigenvector  $\vec{c}_i$  were suggested in [7] and [8], mainly to substitute the propagation in isotropic regions. Basser et al. [9] calculated the trajectories of neural fibers in brain white matter that were generated from the diffusion tensor  $\vec{c}_i$  by integrating along the eigenvector with the largest eigenvalue. Zhang et al. [10] used this method to generate streamlines to visualize continuous directional information in the brain. Ye and Zhang et al.'s algorithm to combine streamlines through areas with planar anisotropy. In addition, we clear the resulting paths into a densely packed thread volume rather than representing them as polygonal models.

**2. Visualization of Vector Fields**  
 Of the creative work on creating effective vector field visualizations, the following two papers are most closely related to our work. Insarsim and Gotsch [11] visualized 3D flow with volume line integral convolution (LIC). As they demonstrated with off-line rendering, their visibility-improving halos improve depth perception and help make complex 3D structures easier to analyze. Our technique builds on this work to produce a similar effect interactively.

Zickler et al. [12] introduced illuminated field lines to visualize 3D vector fields. Our illuminated thread representation is similar, but our volumetric rendering approach renders at a rate independent of the tube or line complexity and combines with

# Talks



# Videos

Video not yet published

# Writing for Videos

- Overview

- We present a linked-window visualization system for visualizing surgical training data. This system visualizes data captured as part of the Surgical Genome Project. We will examine the various elements of the system and then demonstrate how this system can enable new discoveries.

# Writing for Videos

We present a linked-window visualization system for visualizing surgical training data. This system visualizes data captured as part of the Surgical Genome Project. We will examine the various elements of the system and then demonstrate how this system can enable new discoveries.

**We present a system for visualizing multidimensional surgical performance data collected from robotic surgical devices. This dataset captures 300 laparoscopic block-transfer training tasks performed by more than 50 surgeons. Specific variables recorded... If watched in sequence, it would take almost 4 hours to watch all of the video data.**

# Demos

[https://research.cs.umn.edu/mw\\_writing/index.php/BioWim\\_\(demo\)](https://research.cs.umn.edu/mw_writing/index.php/BioWim_(demo))

Thank you Dane Coffey (one of our VERY BEST demoers) for being the guinea pig...

# Current writing support

- Mentoring.
- Word of mouth.
- Trial and error.
- Copy an example.

# Re-envisioned role of writing

- *Reinterpreting*: Conceive of these important modes of communication as forms of writing and use this to inform teaching, learning resources, feedback, etc.
- *Supporting*:
  - Writing in Computer Graphics Wiki
  - Weekly writing group meetings
  - Weekly interdisciplinary talks series
  - Activities designed with C4W staff

# Created support system

[ivlab.cs.umn.edu/writing](http://ivlab.cs.umn.edu/writing)

Daschroe my talk my preferences my watchlist my contributions log out  
Main page page discussion edit history delete move protect watch

## Writing in Computer Science

[edit]

Take a look at [general writing guidelines](#), or advice specific to a certain type of writing.



### ■ Talks

- **Talk Guidelines:** Guidelines for what makes a good talk *good*.
- **Talk Examples:** Examples of talks that illustrate either desirable or undesirable aspects of talks.



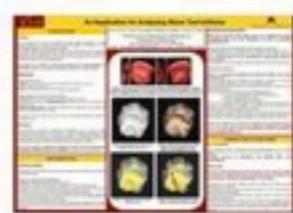
### ■ Demos

- **Demo Guidelines:** Guidelines for how to give an effective software demo.
- **Demo Examples:** Examples of demos that either went well or poorly, and discussion on *how* to give effective demos and handle when things go wrong.



### ■ Posters

- **Poster Guidelines:** Guidelines for creating a poster that grabs attention and communicates your ideas effectively.
- **Poster Examples:** Examples of various posters.



### ■ Papers

- **Paper Guidelines:** Guidelines for how to create an effective research paper, and how to help it get accepted.

# Created support system

## Standard Writing Guidelines

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Some guidelines apply to virtually all English writing. One of the most commonly cited is Strunk and White's *Elements of Style*, which is a very short book that covers English grammar and style.

There are also references which focus primarily on technical writing. Donald Knuth et al. wrote a book titled [Mathematical Writing](#), in which the first several pages briefly cover important topics in technical writing. If you are in need of suggestions, ask almost anyone with a Ph.D., as writing skills are required to successfully get a Ph.D.

The following guidelines should generally be followed for all pieces of writing.

### Contents [\[hide\]](#)

- 1 Be honest
  - 1.1 Cite your sources
  - 1.2 Admit shortcomings
- 2 Use proper English
  - 2.1 Have correct spelling
  - 2.2 Have correct grammar
  - 2.3 Be careful with computer terms
  - 2.4 Watch for common problems
    - 2.4.1 there/their/they're
    - 2.4.2 its/it's
    - 2.4.3 than/then
    - 2.4.4 infer/imply
    - 2.4.5 e.g. and i.e.
    - 2.4.6 And more
- 3 Use proper math notation
- 4 Edit well
- 5 Use appropriate style
  - 5.1 Use clear language
    - 5.1.1 Avoid words like 'large' and 'fast'
  - 5.2 Be self-consistent
  - 5.3 Use active voice (when possible)
- 6 References

# Created support system

## Talk Guidelines

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The goal of an academic talk is to communicate your ideas, and to convince others that your approach has merit.<sup>[1]</sup>

Doing the following will generally help you give a more effective talk.

### Contents [\[hide\]](#)

#### 1 General talk advice

- 1.1 Be prepared
- 1.2 Don't just read
- 1.3 Practice with an audience and time yourself
- 1.4 Know takeaway message
- 1.5 Finish strong
  - 1.5.1 "Thank you"
- 1.6 Make eye contact
- 1.7 Smile
- 1.8 Be excited
- 1.9 Be audible
- 1.10 Know when to be silent
- 1.11 Handle problems well
- 1.12 Stay calm

#### 2 Presentation software advice

- 2.1 Make your slide text legible
- 2.2 Make your figures legible
- 2.3 Make your slides visually appealing
- 2.4 Put key points on slides
- 2.5 Make slides as simple as possible
- 2.6 Have no unnecessary slides
- 2.7 Have all the slides you need
- 2.8 Pause when switching slides
- 2.9 Use a remote
- 2.10 Have backups

#### 3 References

# Created support system

## Poster Examples

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### An Application for Analyzing Stone Tool Artifacts



### Shadow WIM- A Multi-Touch, Dynamic World-In-Miniature Interface for Exploring Biomedical Data



Categories: Posters | Examples

# Created support system

## An Application for Analyzing Stone Tool Artifacts

Added by Lane Phillips, Vamsi Konchada, Matthew Hunstiger, Daniel F. Keefe

View file: [An Application for Analyzing Stone Tool Artifacts](#)

**Status:** This work is not yet finished. Feedback is welcome.

### Author's notes

[\[edit\]](#)

No notes yet.

### Comments

[\[edit\]](#)

Please add comments and feedback below. Be sure that you leave **useful feedback**.



# David's Demo

## Writing in Computer Science

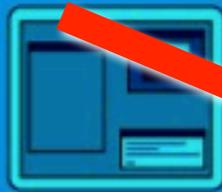
[edit]

Take a look at [general writing guidelines](#), or advice specific to a certain type of writing.



### ■ Talks

- **Talk Guidelines:** Guidelines for what makes a good talk *good*.
- **Talk Examples:** Examples of talks that illustrate either desirable or undesirable aspects of talks.



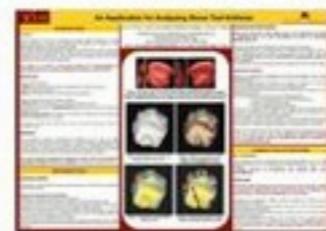
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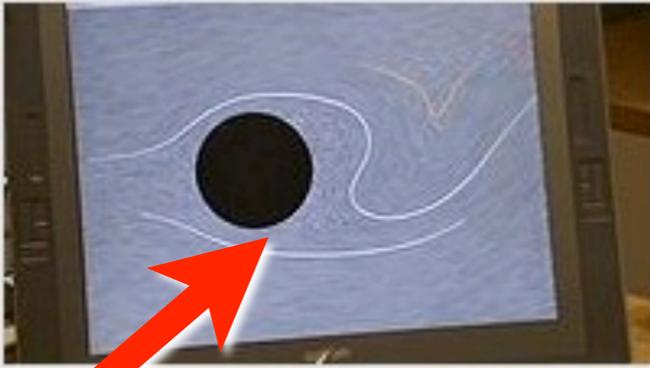
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# David's Demo

## Demo Examples

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Drawing with the Flow



BioWim



Categories: [Demos](#) | [Examples](#)

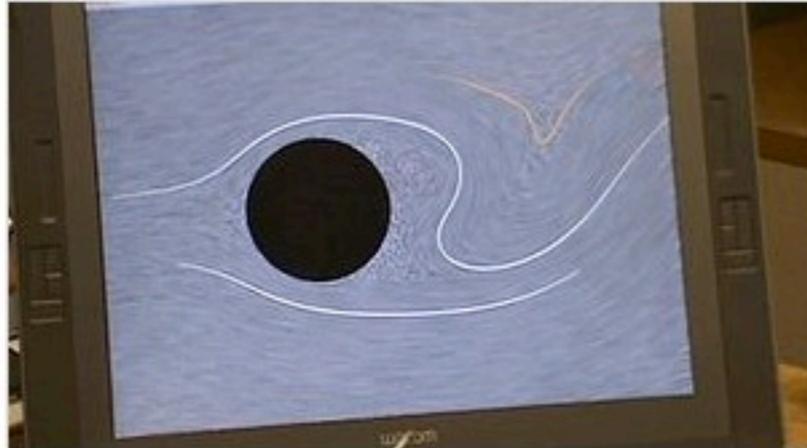
# David's Demo

## Drawing with the Flow (demo)

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## Drawing with the Flow

[\[edit\]](#)



Added by David Schroeder

View file: [Drawing with the Flow \(demo\)](#)

**Status:** This work is not yet finished. Feedback is welcome.

## Author's notes

[\[edit\]](#)

No notes yet.

## Comments

[\[edit\]](#)

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# David's Demo

[https://research.cs.umn.edu/mw\\_writing/index.php/Drawing\\_with\\_the\\_Flow\\_\(demo\)](https://research.cs.umn.edu/mw_writing/index.php/Drawing_with_the_Flow_(demo))

# Example Points of Emphasis / Guidelines

- Begin by introducing yourself.
- Like an elevator pitch, get to the most important point (and visuals or interactive techniques) quickly.
- Learn the right balance of getting the viewers involved (this may change depending on the state of your software).
- The same demo will change dramatically depending upon the audience and purpose.
- Videotape these and review them – you will learn things like we did yesterday!

# Future work

- Culture building
- Content accumulation and feedback
  - e.g., similarity to storytelling
- Wider dissemination
  - initial positive feedback from the SIGGRAPH community
- Incorporating into class and research group activities

**Thank you**