Tapestry Funding Proposal

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Executive Summary

News is available to us in many forms with sources increasingly available on a 24-hour basis. In print, on television, and via the Web, we are bombarded with news images that directly affect how we interpret stories and events. In spite of the great abundance and prevalence of news and news images, however, we as consumers form only a limited view of world events.

Tapestry is a novel net art project for visualizing news rhetoric through images. Taking advantage of the Web and the automated, procedural affordances of the computer, Tapestry searches for and extracts news images from hundreds of globally and ideologically dispersed news sites to re-interpret and render them in collage form. The resulting compositions are designed for large scale display in public spaces, where they can best deliver a common, visual gestalt of the state of the world.

A broad search set enables Tapestry to collect and redisplay potentially thousands of news images, giving viewers an unprecedented, simultaneous view of world events in near real time. By continuously cycling through its sources, Tapestry compositions evolve to always reflect the history of the moment. Images float in and out of the compositions as events surface and drop out of the news. The result is a unique and highly compelling reflection of events that stands to transform the way we see ourselves.

The completed project is ideal for display in "ordinary" public spaces—building lobbies, subway and train stations, and galleries—where it stands to transform them into wholly different and aesthetically engaging environments visually connected to the rest of the world.

This document describes the Tapestry project in detail, including its goals and objectives, methodology, and funding requirements. The concept for the Tapestry project is fully developed; funding is needed to code, test, and implement the project. The principal artist is a developer/designer and project manager with 20 years’ experience in successful, high tech software development.
**Needs Assessment**

In print and on the Web, news images add context and meaning to stories. As consumers we tend to accept this representational and semiotic content without question, a result of the substantial degree of photographic truth we ascribe to images selected by news media. These images impart their own visual rhetoric that shapes our understanding of the world—an especially significant effect, considering that the range of news we encounter on a regular basis is quite small compared to the growing number of available sources, especially on the Web. Culturally, we naturally gravitate towards familiar news sources, further limiting our field of view. As a result, what we perceive about the events around us is often culturally or informationally skewed.

Tapestry is a net art project for exploring the global rhetoric of news through images. Tapestry collects, re-contextualizes, and weaves news images into evolving, computer-generated compositions in collage form, resulting in a visual gestalt of news rhetoric. A uniquely wide yet focused search net, consisting of hundreds of news sites and potentially thousands of images, includes globally dispersed and varied news sources, from mainstream and alternative media to small town newspapers. The completed Tapestry project thus stands to create unique compositions simultaneously representative of multiple cultures, points of view, and spheres of awareness.

**Visualizing the Rhetoric of News**

Images have profound effects on us and can evoke the entire range of human emotion and reaction. We ascribe significant power to the images we encounter in the realm of popular culture, news, and art—including, for example, the power to calm or incite action, the power to convince or convulse, and the power to repulse or please.¹ News media are well aware the power of images and regularly invoke it to shape—and sell—news coverage.

Tapestry capitalizes on our visceral connection to images by appropriating and arranging news images into new amalgams of world events. Its broad search set naturally reveals trends—as when a single story dominates mainstream news—as well as interesting chance juxtapositions. For example, a recent run of the Tapestry prototype, when Edvard Munch’s *The Scream* painting was stolen, produced highly compelling compositions of this iconic figure alongside images of fighting and destruction in Iraq.

A worldwide news focus assures broad appeal and applicability. Tapestry exposes viewers to a range of images they might not encounter through conventional browsing sessions or even in collages created via other means. As a result, Tapestry’s compositions regularly step outside the viewer’s experience and comfort zone—an especially desirable effect.

Tapestry’s compositions are dynamic, and specific groupings are ephemeral. In general, if a composition at any given moment closely resembles a viewer’s perception of the world, the reason is that a specific terrorist attack, a significant natural disaster, or the death of a celebrity is the feature news at that time. A viewing naturally leads us to question how the evolution of images—in this or other media—shape or contribute to our conceptions.

Tapestry takes a media critique approach to considering the way images are employed by news services, how we consume them, and how that compares with the way we perceive the state of the world. Separated from their accompanying text, what do the images themselves communicate? What do they tell us about how the media (particularly photographers, editors, and producers) choose to decorate their stories? Moreover, what new meanings surface when these raw news images blend into new compositions?

With the Web as a source of collage elements, the font of available “raw” image materials with which to create and evolve compositions is ever changing and unpredictable. The chance compositions that result are an important aspect of the project; they evoke the critical, fragmented, and potentially absurd qualities and juxtapositions initially exploited by Dadaist and Futurist artists of the early 1900s.
Project Goals and Objectives

As a net art project, Tapestry naturally shares some common conceptual and functional ground with related and prior digital works. However, distinct and significant differences exist between the proposed Tapestry deliverable, as encapsulated by the following objectives:

- **A uniquely broad focus on news sources** – Tapestry reveals the fabric of current events in near real time by employing a search net that includes *hundreds* of news sites from around the world, including large news conglomerates and small town newspapers. By maximizing the user of the Internet and casting a uniquely wide search net, Tapestry visualizes the rhetoric of news through compositions that are simultaneously representative of multiple cultures and points of view.

- **Unprecedented near-present compositions** – The increasing number of online news sources creates exciting and compelling possibilities for access to other parts of the world. The relatively low latency of information access and near simultaneity afforded by modern, high-speed networking affords a kind of unprecedented “nowness” of image presentation. Moreover, continuous cycling through the URL list combined with an object-oriented approach to image gathering make possible near-immediate views of events large and small around the globe.

- **Informationally balanced results** – One of Tapestry’s tenets, informational balance is assured as much as possible through a sufficiently large and varied URL set. Other works use an inherently flawed approach that searches as few as three (primarily Western) news URLs to reflect the state of the world. By significant contrast, Tapestry attempts to build a balanced picture by using not just Western sources, but sources from Africa, the Middle East, and the Pacific Rim, and other areas. (See Appendix A for a working country list.)

- **A compelling image-only collage** – Tapestry capitalizes on our visceral connection to images by appropriating and recasting news images into dynamic amalgams of world events. Its broad search set naturally exposes trends—as when a single story dominates mainstream news—as well as interesting chance juxtapositions. The highly compelling chance combination of *The Scream* alongside images of destruction in Iraq is one such example. Tapestry specifically aims to reveal thematic content in a recognizable way; “popular” stories, juxtapositions, and singletons (images to which there is but one reference) should be distinctly identifiable.

- **Targeted selection focus with broad appeal** – A varied worldwide news focus gives viewers of all types something with which to connect. A selection or tuning mechanism is specifically avoided to assure that Tapestry presents

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2 Archival content (i.e., content related to events that occurred in the past) is not specifically included in Tapestry compositions unless it has been used by a news source to support a current story. Compositions therefore present a snapshot of the news and events of the moment.
images and compositions viewers may not see through conventional—or habitual—browsing sessions, or through collages created via other means.

- **Compositions as catalysts for discussion and reflection** – Tapestry’s broadly sourced compositions may be visually striking on their own, but they should also evoke questions in viewers’ minds: Is this what’s really happening on global scale? How does this differ from the news I normally consume?

Although it uses the Web as its source for material, Tapestry is not about Web browsing or about creating an alternative browsing experience. It is also not specifically about “information art,” although it shares some conceptual overlap with prior projects in this area.

The proposed Tapestry project deliverable will function as a self-contained application that, when run on an Internet-connected computer, will automatically generate an evolving image collage of world events in real time. Compositions will vary over time (minutes and days) in parallel to current events. The final application will be geared towards long term, large-scale display in common or public spaces.³

Tapestry uses the images it collects in fleeting compositions. Images are not stored, retained, or reused long term and all images remain the copyrighted material of their respective owners.

**Demographics and Applicability**

Two broad user classes have to be considered for this application: the end users (audience) and the buyers/installers of the application. In some cases, the installers may also be the participants.

The Tapestry concept is designed for use in public or common space, and the true end user is therefore the “public.” For this user class, the application does not involve a buying decision, only the choice of whether or not to view the compositions, just as one might decide whether or not to examine a painting or sculpture.

As news-oriented net art product, Tapestry has broad appeal that reaches across age and socio-economic strata. Culturally, we can reasonably assume that the majority of groups already exposed to television, and certainly those familiar with the Internet, will be attracted to a visually oriented installation of this nature.

The potential “buyers” for Tapestry are organizations and corporations willing to sponsor public art. In this context, the installation could be used standalone, as part of a larger context like an outdoor concert, or as part of a larger media art exhibit.

A less public but nonetheless common setting is the corporate campus or building lobby, where Tapestry can also provide a compelling display. Such an installation

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³ Tapestry will also run on high-resolution personal computer displays although it is not specifically designed to be an isolated desktop browsing experience.
may require different operating parameters, however, so that resulting compositions are more deterministic than is possible by sourcing images from all over the world. In a corporate setting, the search space could be restricted to a smaller, controlled image set (which can be quite large, but focused).
Methodology

Compositional Foundation

The practice of aggregating materials from different sources into new compositions has a rich and longstanding tradition. It has been effectively and repeatedly used to make artistic statements that challenge or reshape viewers’ perceptions of the recomposed contents.

The word “collage” was first applied to this practice by Dada and Surrealist artists working in the early 20th century. Collage surfaced then as a nihilistic and antirationalistic critique of society and as a reaction to established societal norms and artistic conventions. By the 1960s, collage had become a major Pop art form. The work of painter and graphic artist Robert Rauschenberg, for example, combined photographs collected from magazines and newspapers into silk-screened amalgams of American history and popular culture.

Reminiscent of Rauschenberg’s work, Tapestry produces dynamic and evolving amalgams of world history and popular culture in the making. The visual medium is the computer or projection screen; the raw materials are Web-based news images. Unlike traditional collage work that yields snapshots frozen in time, Tapestry’s news image-based compositions continually evolve to reflect the history of the moment.

Design Problems & Approaches

Implementing Tapestry involves addressing a number of organizational and computational challenges. The associated design and development issues overlap with a number of active research areas in computer science and information architecture, including search, image analysis, and information visualization.

The completed project should be able to systematically cycle through hundreds of online news source URLs to retrieve images. Tapestry must not only collect and re-display these images, but it must present them using an arrangement that is both aesthetically appealing and conveys information. The resulting search could generate thousands of images in a single pass through the URL list; artfully and meaningfully presenting this content in collage form is a significant visual and information design problem.

Most of associated design challenges revolve around the need to support the key objectives identified in the previous sections. Specific issues problems include:

- **Balancing images from both large and small sources** – Images from The New York Times, for example, should not be favored over images from, say, The Manhattan Mercury in the small town of Manhattan, Kansas. Large news outlets are likely to share many of the same top stories. Small or non-mainstream sources are likely look at the same stories in different ways. The
latter will also introduce singletons: images associated with stories that are carried by only one news outlet.

- **Maintaining a geopolitically representational balance** – Tapestry should yield a reasonably unskewed representation of current events. Compositions should not intentionally favor (or obscure) particular issues, countries, or points of view. Careful selection of URLs accomplishes this in part; the rest must be handled by the way in which the images are retrieved. Multiple program threads may be used to extract images at different rates for differently represented geographical areas.

- **Handling the same (or similar) image from multiple sources** – Repetition across sources typically indicates a heightened awareness of a particular story or event. It also adds to the prominence of an image or theme. In this case, capturing the repetition is important and must be revealed. The repetition (especially if like images are grouped in the composition) will naturally have more prominence, or visual weight, than other elements of the collage.

- **Handling the same image from a previously searched source** – When making repeat passes through one or more sources (as when cycling through the URL list), images that have not been updated should probably not add to the collage; if the image is the same, the composition does not change. Meta information about each displayed image (e.g., where it came from and which image it is) will have to be tracked to enable this.

### Architecture and Functional Description

At present, the Tapestry design employs three main functional components for loading URLs, parsing page content, and placing the extracted images. Tapestry’s principal functional components, as depicted in Figure 1, are:

- **URL Parser** – The URL parser reads URLs from an external URL list file, checks them for valid form, and builds an internal data structure from which to select URLs to be passed to the page reader.

- **Page Parser** – This component interprets the HTML content of the current URL to search images. It extracts the images and evaluates them with a number of specialized content analysis routines. The page parser then passes the image and its meta information to the screen manager for placement.

The content analysis routines use one or more image analysis techniques to provide a measure of visual similarity between images. An externally configurable threshold approach to similarity may be employed to enable identification of images whose content is sufficiently similar but not exactly the same. The routines may also serve to filter likely advertisement graphics that might otherwise pass for news images.
• **Screen Manager** – The screen manager determines all aspects of image display and tracks existing image metadata and layer management. The manager uses image meta information in concert with an external set of image placement rules (IPRs) to determine image location based on the active layer and candidate image similarity to existing content.

Placement considerations may include applying clustering rules, degree of overlap with existing content, and edge/overlap transparency or other effects. The manager also tracks image lifetime; if layers are employed, the screen manager also tracks the lifetime of each layer and automatically fades or removes old layers as they expire.

![Diagram of Tapestry's high-level architectural component view](image)

**Figure 1**: High-level architectural component view of the Tapestry project. The main functional components are shown in green; the white boxes represent external files for URLs, image placement rules, and image analysis.

Tapestry’s multiple external configuration files establish its operational parameters. The external files include the URL list, a list of advertising-related keywords, and image placement rules, including:

- **URL List** – This is an external text file that contains the list of URLs to be searched. The list is likely to be several hundred lines long, representing a broad, globally dispersed and ideologically varied set of news sources. As a text file, the list may easily be edited to expand or re-direct the search domain. In a special-purpose deployment, for example, the list may be limited to a restricted-interest server list or other custom set of Web-based image content (e.g., a dedicated internal Web server or image repository).
• **Advert Identifiers** – A list of advertising and non-news related keywords to be used in making decisions about image relevance. These terms may appear in the URL path of an image (many advertisement URLs refer to easily identified third-party image and content hosts) or in the ALT attribute of an image tag. The former appears to be a more reliable test for image content, but both methods may be used for completeness.

• **Image Placement Rules** – In general, the IPRs are the heart of Tapestry’s aesthetic controls. They define programmatic guidelines for image placement, including:
  - the degree of overlap between images
  - image positioning within a plane or layer, per image analysis results
  - active plane/layer selection
  - the lifetime of an image layer (and/or perhaps of image clusters within layers)
  - inter-image effects, including alpha blending along edges
Project Phases & Timeline

The conceptual framework for the Tapestry project is reasonably well established, and a working prototype has been developed as proof of concept. The remaining design and implementation objectives include final visual and system architecture design, followed by initial coding, user testing, and final coding and application testing.

- Visual Design – The key project component, visual design establishes the principal guidelines for treatment of collected images. The result directly informs the project’s image placement rules. Aspects of the visual design may evolve as the project is developed and tested.

- Architectural Design – This phase defines the application structure needed to support the desired visual design concepts. Includes specifying functional modules, approaches to image and meta information collection, and related elements as described in the Functional Architecture section of this document. Early architectural design work overlaps with visual design.

- Initial Coding – Initial coding of functional elements. Initial coding will likely be segmented so that components may be individually written and tested, using a kind of “unit testing” approach. This allows showing that individual component a functional before they are linked to other parts of the application.

- Testing – The testing phase is described above in the Application Testing section within Methods & Approaches.

- Final Coding & Testing – This final phase involves completion of all programming tasks as well as final functional application testing. Results from the prior testing phase (and user-based testing, if carried out) are incorporated during this phase.

- Documentation – Documentation efforts closely parallel the bulk of the project’s development and testing phases.

Assuming the staffing requirements outlined below are realized, the project time frame for completion is six months from project start.

<table>
<thead>
<tr>
<th>Project Phase/ Month</th>
<th>1st Month</th>
<th>2nd Month</th>
<th>3rd Month</th>
<th>4th Month</th>
<th>5th Month</th>
<th>6th Month</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual Design</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Architectural Design</td>
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<td></td>
<td></td>
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<tr>
<td>Initial Coding</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>User Testing &amp; Field Trials</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final Coding</td>
<td></td>
<td></td>
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<td></td>
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</tbody>
</table>
Project Evaluation

Application Testing

There are two likely testing phases for Tapestry: application and user testing. Application testing is required to test all aspects of functionality. This phase includes running the application while monitoring the Java console, implementing test-specific code to create log files for tracking performance, image retrieval errors, and other relevant status information. The data collected is initially useful as a debugging tool, but may also be useful for field tuning and as the basis for a statistical record of performance: number of sites visited to date, number of images collected, number of images recycled by sources, etc.

The development and testing system is a Windows XP-based personal computer running at 3.20 GHz with a HyperThreaded processor and one GB of memory. The development version of the Tapestry application is continually tested on this machine. A working prototype (described in the next section) has been tested on this and a much a slower 600 MHz machine, where it runs acceptably. For the most part, Tapestry is not processor intensive. Its functionally does not directly depend on system performance, and the final project should run well on any reasonably fast, modern machine.

Field trials of the application are planned for the fourth month of development. This trial testing of the Tapestry prototype will be used to analyze the work’s effect on viewers and to obtain feedback that can be used to fine tune application behavior—primarily as concerns information visualization. The ideal test scenario would require Tapestry to be set up as a peripheral display for each individual tested, with each display placed within the subject’s normal work or home environment.
**Staffing & Equipment**

**Project Staff**

The Tapestry project requires a relatively small staff. To support the principal artist/developer, two additional positions have been identified. The following describes all three roles:

- **Principal Artist / Software Developer** – Conceptualization and code development are largely sequential and obviously interrelated project phases that can be carried out by the principal artist/developer. This person (see the Artist Qualifications section at the end of this document) is responsible for the vision of the project and for making sure that software development fully supports this vision. The principal artist/developer works full time for the duration of the project.

- **Software Developer** – This developer supports the principal artist/developer through all software development and testing phases. The ideal candidate is an experienced Java developer but need not be an artist.

- **Administrative Assistant** – A part time support person, the administrative assistant supports the developers with typical office support and other largely non-technical aspects of executing a software development a project.

**Equipment**

Tapestry development is carried out in Java, and the final product will be a full Java application. Java is a powerful coding platform with built-in functionality to facilitate traversing the Web and analyzing and managing images. The software development environment is the Eclipse IDE and Java 1.4.2_05 SDK.

As a true Java application, Tapestry will run on any current, Java-enabled computer platform. It is not designed to run in a Web browser. The Tapestry code assumes it is running on a reasonably high performance computer connected via high-speed link (e.g., a standard broadband connection) to the Internet and that the connection is unrestricted in terms of accessible domains.

Development and testing requires a suitable development platform. For the most part, this comprises one late model, high performance computer for each developer. In terms of software, the freely available Eclipse Java development environment will be used; there are generally no additional costs in terms of software. This expense is listed as “Equipment.” In addition, a high-speed Internet connection is required for all phases of project development as well as for the “production” version of Tapestry.

The testing phase may require installing computers in volunteers’ offices for the duration of the evaluation. Any reasonably modern desktop or notebook computer should be able to run the Tapestry application. Minimum requirements for these computer systems include:
- High-speed Internet connection without restrictions in terms of accessible domains
- High-resolution display (1280 x 1024 or better)
- At least 1 GB of RAM
- A reasonably fast CPU (2 GHz for Windows, or 1.5 GHz for OS X)

**Budget**

Tapestry is largely a computer software project, so the greatest expense is in the number of man-hours required for design and implementation, including the coding and testing phases. In terms of hours, assuming a single developer/artist working 40-hour weeks over a period of six months (24 weeks), the project will require approximately 1,000 hours. Using currently typical contract programming rates of $40 to $60 per hour as a basis, the final development cost is between $40,000 and $60,000. This expense is listed as "Salaries" in the following table.

If the project is to be shown in a public or common space, a suitable projector is required for the intended display area. If the projection area is an interior space, an LCD projector of appropriate brightness (around 2000 lumens) may cost $2,000 to $3,000.

<table>
<thead>
<tr>
<th>Sources</th>
<th>Amount</th>
<th>Uses</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grants</td>
<td>$100,000</td>
<td>Salaries</td>
<td>$120,000</td>
</tr>
<tr>
<td>In-kind Donations</td>
<td>$30,000</td>
<td>Professional Fees (legal)</td>
<td>$2,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Equipment/Computers</td>
<td>$5,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Office Supplies</td>
<td>$300</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Postage &amp; Delivery</td>
<td>$300</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rent &amp; Utilities</td>
<td>$1,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Travel / Transportation</td>
<td>$1,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Field Trials</td>
<td>$1,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Installation &amp; Equipment</td>
<td>$4,000</td>
</tr>
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<td>I. Total Income</td>
<td>$130,000</td>
<td>II. Total Expense</td>
<td>$134,600</td>
</tr>
</tbody>
</table>

The budget specifies a travel allowance of $1,000 for travel and transportation costs. In general, this covers the cost of traveling to potential installation sites and the cost of subsequent travel to the selected site from the artist’s home base of Atlanta. Final transportation expenses may be higher or lower.

**Return on Investment**

The ROI associated with the Tapestry project is not immediately measurable in a specific dollar amount. As is the case for traditional art forms, the value of new media art is inherent in the experience of viewing it. Reminiscent of the way looking at a complex tapestry or painting can reveal new things with repeated viewings, the Tapestry project evolves to expose the fabric of current events as they continually interweave in real time.
**Artist Qualifications**

Principal artist/developer Maria Cordell is an accomplished programmer and project manager with 20 years’ experience in high-tech software development. She is also a published author and photographer with numerous awards to her credit. She holds a BS in Physics, with High Honor, and an MS in Information Design and Technology, both from the Georgia Institute of Technology.

Maria’s combined expertise in software development, project management, and photography place her in a uniquely qualified position for conceptualizing and executing complex and visually oriented new media art projects. She is an active member of the Topological Media Lab (TML) at the Georgia Institute of Technology, where she is actively involved in the group’s calligraphic video projects and the creation of novel physics model-based instruments for engaging interactive play.

The result of Maria’s work in calligraphic video was featured in the spring of 2004 as *The Last Supper*, a one-night event that completely transformed Georgia Tech's ordinarily bleak Third Street tunnel into a vibrant interactive experience. The same calligraphic video instruments also formed the technical foundation of *Membrane*, an art experiment in social thickening developed in concert with members of sponge.org. *Membrane* was featured at the Dutch Electronic Art Festival (V2_:DEAF04) in Rotterdam, November 2004.
**Appendix A: News Source Country List**

The following is a sample of the more than 150 countries from which news sources are likely to be searched for images. (Collected from newspaperindex.com.) Note that, on average, each country listed equates to about five news sources; there total number of potential news sources is therefore far greater than the number of countries listed below.