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## **Brief description:**

Vectorial Elevation was a large scale interactive installation that transformed Mexico City's historic centre using robotic searchlights controlled over the Internet.

Visitors to the project web site at <http://www.alzado.net> could design ephemeral light sculptures over the National Palace, City Hall, the Cathedral and the Templo Mayor Aztec ruins. The sculptures, made by 18 xenon searchlights located around the Zócalo Square, could be seen from a 10-mile radius and were sequentially rendered as they arrived over the Net.

The website featured a 3D-java interface that allowed participants to make a vectorial design over the city and see it virtually from any point of view. When the project server in Mexico received a submission, it was numbered and entered into a queue. Every six seconds the searchlights would orient themselves automatically and three webcams would take pictures to document a participant's design. An archive page was made for each participant with comments, information and watermarked photos of their design. A notification email message was sent once the archive web page was done.

Vectorial Elevation received participants from over 50 countries and all the regions of Mexico. To facilitate access, free terminals were also set up in public libraries and museums across the country.

The Zócalo's monumental size makes the human scale seem insignificant, an observation that has been noted by some Mexican scholars as an emblem of a rigid, monolithic and homogenizing environment. Searchlights themselves have been associated with authoritarian regimes, in part due to the military precedent of anti-aircraft surveillance. Indeed, the Internet itself is the legacy of a military desire for distributed operations control. By ensuring that participants were an integral part of the artwork, Vectorial elevation attempted to establish new creative relationships between control technologies, ominous urban landscapes and a local and remote public. It was intended to interface the post-geographical space of the Internet with the specific urban reality of the world's most populous city.

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Note: the searchlights were taken down at 6:30 AM, January 7, 2000. However, most of the site's features are still operative, including the 3D interface. The web site will go live again for future installations in different cities.

## Technology

Vectorial Elevation consists of a network of computers that process user requests in a first-come first-serve basis. Here are the different technologies involved:

The user reaches [www.alzado.net](http://www.alzado.net) via an IP address given to us by Telmex company [Centec](#), who have provided the connectivity and the mirror infrastructure for the project. Telmex is the largest telecommunications company in Mexico and the premier internet service provider through its Prodigy operations.

The web server is a [kyx.net](#) Linux/Apache box filtered through Dragon security sensors donated to the project by [Network Security Wizards](#) in addition to [Snort](#) IDS using [Max Vision's](#) ruleset, [Trinux](#) video reflectors, and other firewalls programmed by [dragostech.com](#). This Edmonton-based company has also provided the customized solutions for security, routing, load balancing and video streaming. Some of these tools are available for download [here](#).

To make a design, the user downloads a Java applet created by Relational Art, an R&D company directed by Rafael Lozano-Hemmer. This applet contains [Shout3D](#) code which allows for real time 3D visualization of vml files without the need for browser plug-ins. [Shout Interactive](#) in San Francisco has also provided a frame for the development of an application to extract jpegs from the vml world. The actual 3D modelling was designed by architect Emilio Lopez-Galiacho from [Arquimedia](#) in Madrid.

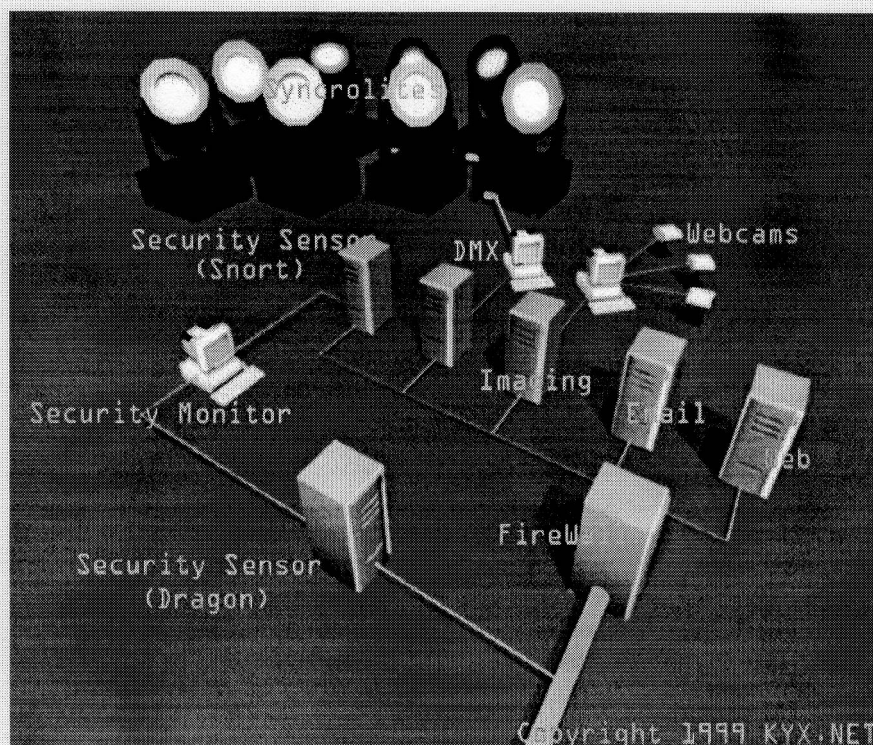
When the participant submits a request the applet sends the exact x, y and z coordinates of each of the 18 virtual searchlights, as well as user information such as name, location and comments. The server queues this request and estimates a time for completion which is reported back to the user. A "proximity engine", searches the database of previous participants and reports back the five closest matches to the participant's design.

When a request reaches the head of the queue, the data is sent to a 3D DMX application built by [APR Inc](#) of Canada. This application knows the exact 3D position of each searchlight thanks to a calibration performed with differential GPS units from [Trimble](#) in Sunnyvale, California. The APR application sends appropriate DMX commands to the 18 [Syncrolite](#) SS7K searchlights to place them in the desired location. The SS7Ks are 7kW xenon robotic fixtures that produce a collimated lightbeam that can be seen from a 20Km radius. Vectorial Elevation allows user control of 126,000 watts of power.

When the searchlights produce the participant's design three [Axis](#) webcams take digital pictures from the skyscraper, the National Palace and the Gran Hotel. The images are watermarked with the participant's information using a custom application built by Relational Art. This application uses two ActiveX components from [Pegasus Imaging](#). As soon as the pictures are taken, a web page is built for the participant and an email is sent to him or her with its URL.

A user may view his or her web page by entering the personal code or by typing the URL in a web browser. The personal page contains the real and virtual images of the user's design as well as their name, location, date, time and comments.

The piece will be running for 10 days and it is estimated that 60,000 people will be able to create their own design. Hundreds of thousands will also be able to see the streaming video coming from the 3 webcams via Dragostech's custom java applet and server [kyxpyx](#), an open source package.



Network diagram of the [kyx.net](#) server farm you are reading html and watching the video from... click the image to find out [more](#).

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# Vectorial Elevation Archive

Relational Architecture 4

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Name: tomas sanchez sanchez  
Location: d.f.  
Code: 6675  
Date: 03/03/2000  
Time: 11:13:46

Comments: Un feliz año a todo mexico

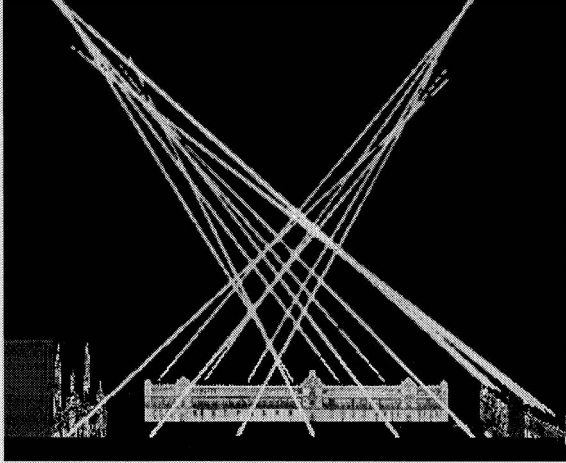
**POOZ**

Archiv

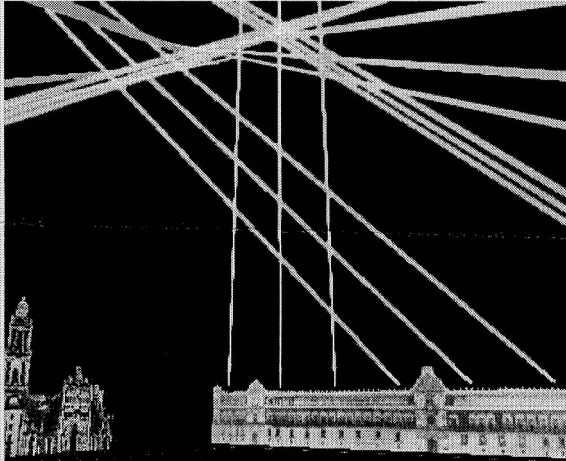
Virtual

Real

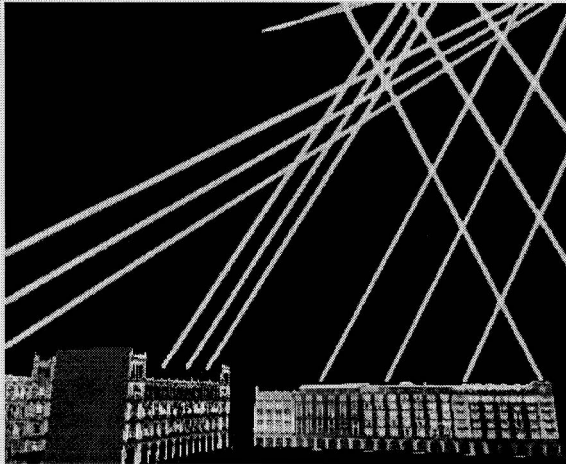
Camera at the Torre Latinoamericana Skyscraper



Camera at the Gran Hotel



Camera at the President's Balcony



Thousands of pages like this one at <http://www.alzado.net>

Previous

Next

Print this page!

Code

Search

Show me the five closest matches to my design

022-4  
webs

DK

## Complete Credits

Rafael Lozano-Hemmer - Concept, direction, interface.

Relational Art (Spain / Canada)

Will Bauer - Project manager.

Conroy Badger - Lead programmer, Java engine, DMX control, Shout3D applet.

Crystal Jorundson - Webcam watermarking, differential GPS, vrmf jpeg generation.

Dragos Ruiu - Server, security and streaming video programming.

Kimihiko Sato - Streaming video client, servlets.

Emilio López-Galiacho - 3D Modelling, vrmf export.

Paul Pelletier - Case and MSD programming

Kelly Myers, Ana Parga, Susie Ramsay, Therese Gaetz, Rob Lake, Greg Bodnar -  
Production assistance

Conaculta (Mexico)

Rafael Tovar - President

Ignacio Toscano - Coordinator for the Millennium celebrations

Juan Ramón Ayala - Production manager

Alicia Martínez, Lilia Vera, Fernanda Garfias, Lourdes Melgoza, Guillermina Ochoa,  
Ernesto Betancourt, Felipe Leal, Jorge Bracho, Ariel Rojo - Production assistants

Rac Producciones, Grupo CIE (Mexico)

Guadalupe de Anda - Production Manager

Luis J. Vargas, Mario Torres, José Antonio Barona, Luis Pérez, Miguel Angel Villa,  
Armando Sánchez, Arturo Mendoza, Alejandro Echenique - Production team

Syncrolite (USA)

Jorge Gallegos - Lead Technician

Alberto Meza, Renato del Castillo, Jeff Moss, Sergio Martínez, Mauricio Martínez, Omar  
Rivas, Raúl Rios, Roberto Diaz - Technicians

Jerry Woods, Harold McLallen - Clifford Power

Telmex, Centec (Mexico)

José Manuel Cortés - Director

Ricardo Medina - Development Manager

Jorge Huesca Salas, Alejandro Fuentes, Héctor León - Centec engineering

Ricardo Rodríguez Aguilar - Sistemas support

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