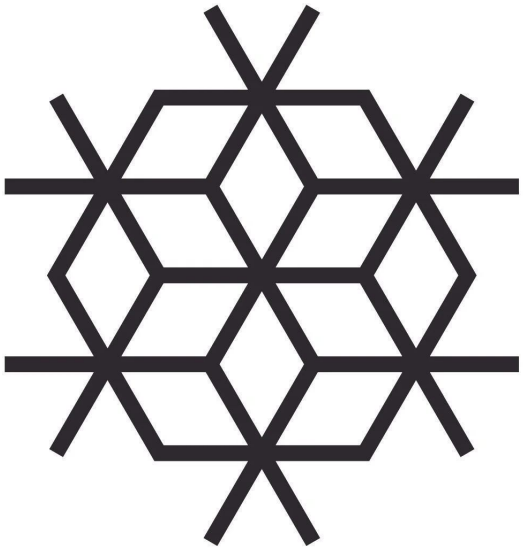
General Proposal for the Creation of Physical and Digital Spaces



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I. Smart Mural

Smart Mural is a hybrid of the mural concept, audiovisual spectacle and technology. Each piece is synchronously and integrally generated in its different forms of expression. This is followed by innovations and solutions that extend the physical space with AR. Furthermore, we are dedicated to having a positive impact on our communities through the dissemination of our creative processes to influence future projects, universities and the general public.

Our team consists of professionals in sciences, engineering, design, arts, and organization of cultural events. With years of summed experience and teamwork, we offer a creative fusion of art, science, and technology that opens the door to specific solutions in public and private spaces. We intervene spaces using all possibilities from plastic arts (monumental mural, stained glass, sculpture, spaces design, among others) to the digital (acoustic environment, augmented reality, video-mapping, illumination, evolving projections, etc.) seeking to generate ever changing social and cultural content through the application of new technologies. It is an innovative approach for aiding the general public to seamlessly adopt Social Organization and Community Integration through technology, by enriching the physical and virtual environment with artistic projects that foster the implementation of digital platforms to functionally enhance spaces.

We organize cultural events and public art spaces in government buildings, university campuses, museums, retail spaces, hotels, transportation hubs, and cultural plazas, among others. Given this natural dissemination among the public, we proceed to utilize the various technological media to promote the use of new technologies and solutions in social events and public spaces.

Mexican Muralism was an artistic movement created by mexican painters in the early 20th century, born out of the need for identity and national reconstruction following the Mexican Revolution and the recent impact of World War I. Artists and intellectuals sought a new national identity, aiming to consolidate the social ideals forged during the revolution through their art. By 1923, Muralism had become well-known both within and beyond Mexico. The so-called "Big Three" were David Alfaro Siqueiros, Diego Rivera, and José Clemente Orozco, and preceding them, Gerardo Murillo Coronado (a.k.a. Dr. Atl) who used his influence to call for a monumental public art movement in Mexico linked to the lives and interests of the Mexican people. Muralism changed many people's perceptions of Mexican Indigenous communities, highlighting their culture and teaching their history. Many murals were created across much of Mexico between 1920 and 1970, often focusing on themes of politics and nationalism, with references to the Mexican Revolution, mestizo identity, and the history of Mesoamerican cultures.

Today, we live in an era enriched by electronic machines and technology. Computers have impacted nearly every aspect of our lives, including the arts. New forms of art are being created. New musical sounds are being heard. New formats and techniques for visual composition are being explored. It is inevitable that some people feel uncomfortable with certain new forms of expression. It is unsurprising that computers and the electronics industry have sometimes been perceived as having a dehumanizing effect on the arts. This raises a question: do electronics or computers truly represent something new? In reality, the fundamental change occurred when homo-sapiens stopped using only their voice and bodies as the sole source of sound. When Orpheus took up his lyre, he was using a sound-generating device. Today's devices, like computers, are merely tools for producing new forms of art, which are, in this sense, firmly rooted in traditions forms of a distant past.

Modern anthropological studies and technological developments, such as Big Data, Artificial Intelligence, Social Organization, and Network Communication, among others, are the result of interactions between the humanities and natural sciences. A large portion of the GDP of developed countries depends on mathematical research, not to mention technologies, engineering, and sciences. It has been recognized that challenges that engineering must solve, from climate change to diseases or poverty, are tied to human realities. However, the humanities —and particularly the arts—are often excluded from this group.

II. Objectives

General

Modern social development plans align with the proposals outlined here, emphasizing both educational and technological innovation as well as the implementation and modernization of institutional processes.

It is clear that there is a relative divide between the social and natural sciences. However, most of the current crises and challenges faced by the global community are socio-technical in nature. This means they can only be understood within an integrative context where natural and social sciences coexist in the analysis and eventual solutions. This initiative was born to promote this approach through artistic and professional collaborations across various fields, focusing on educational and cultural centers. Our general objectives are to:

- Implement cutting-edge technologies in Jalisco and Mexico, starting with university campuses and public spaces in the region.
- Leverage available resources, such as augmented reality and smart technology, to improve the functionality and efficiency of institutions and public spaces in their processes.
- Have a real impact on various academic centers in the region and abroad.
- Foster new ways of understanding the close relationship between art and science, both within and beyond university campuses.
- Inspire creative collaboration between artists and scientists to achieve greater multidisciplinary synergy among professionals from traditionally segregated fields.
- Enrich the creative experience of artists, scientists, and the general public by promoting interdisciplinarity.
- Encourage collaboration as a tool in the study of the sciences.

By bridging disciplines and fostering collaboration, this initiative seeks to create a lasting impact on education, art, and technology.

Specific

Our main objective is to achieve greater dissemination and promotion of art and science while providing public spaces with innovative solutions for everyday life. All the methods of creation and technical knowledge we employ are offered through workshops and talks aimed at students, academics, and the general public. In this way, we bridge the gap between society and ever evolving social organizational processes. These activities will provide a description of the work carried out and a contextualization of the creative process, influencing future projects. The specific objectives for this are to:

- Create mural artwork where technological media converge with the social impact of artistic expression. Contribute to muralism by incorporating new technologies and forms of expression.
- Disseminate knowledge about the connection between science and art through workshops and conferences that provide a description and contextualization of the creative process. This will influence future multidisciplinary projects that propose innovative solutions both inside and outside academic institutions.
- Offer an enriching cultural and academic experience for students and practitioners of science and the arts, presenting a holistic vision that fosters interdisciplinary collaboration in the creative process of future solutions.
- To bring our solutions and services to different institutions, we deliver tailored and targeted proposals with an execution and project development plan, highlighting the advantages and values of each proposal.

Values and Philosophy

Our members are committed to making a positive and tangible impact for communities. For this reason, our methods and technical knowledge are offered through workshops and talks aimed at students, academics, and the general public. In this way, we bridge the gap between society and the evolving organizational processes. Positive social changes can be achieved in universities and educational centers if we promote new ways of interdisciplinary collaboration, adhering to our core values:

- **Work Ethics.** Our team is composed of individuals with big ideas, and we understand that big ideas require significant effort to realize. Our members approach their work with great responsibility and demonstrate ethical practices to complete projects.
- **Professionalism.** We value professional work of the highest quality, adhering to international standards. Our team includes experts in Information Technology, Art, and Design.
- **Excellence:** All Smart Mural services and products adhere to a standard of excellence. Each project is prepared to deliver a final product aligned with our mission of quality and excellence.
- **Innovation:** In both the arts and technological solution development, we utilize unique techniques, codes, algorithms, and methods. A significant part of our work focuses on innovation in art and technology.
- **Teamwork:** To achieve creative and realistic solutions, we rely on multidisciplinary collaboration. Teamwork is one of our most valuable tools during the creative process, and we take it seriously.
- **Social Responsibility:** Research and technical descriptions of art projects are shared with various audiences through public or specialized talks and workshops. We support social development by fostering positive influences in academic centers and universities in the region.

MISSION

Offer a culturally and academically enriching experience for students, teachers, and practitioners of the sciences and arts, as well as the general public. Present an integrating vision of both disciplines, promoting multidisciplinary projects and creative solutions for various applications.

Furthermore, we seek to implement technology in community solutions while fostering collaboration in the creative process, and to bring cultural and academic events to different public spaces and universities of the region, ensuring that these institutions have access to activities of international standard that promote the development of arts and science.

VISION

By fostering interdisciplinarity, we will enrich the creative experience of artists, scientists, and the general public, by promoting collaboration as a tool for the development of sciences and have a tangible impact on universities. Simultaneously, contributing to muralism with new technologies and forms of expression that combine art, science, and technology for the benefit of the community.

III: Solutions and Services

The work aims to reach a diverse audience through everyday technologies such as mobile devices and communication networks by extending and perpetuating the artwork through the virtual interface, designed to view the digital piece from any smartphone, thus fostering the possibility of expressing ourselves through digital arts. At the same time, it offers the opportunity to leverage the digital platform for a series of technological enhancements to the physical space as a whole.

Within the campus setting, institution, or private space where an intervention takes place, the virtual platform can be used to enhance and extend communication and social organization processes, from driving campaigns to the responsible capture and analysis of user data to improve user experience. Cultural events organized by the team help provide greater dissemination and social impact. Additionally, workshops and conferences will offer a description of the work done and a contextualization of the creative process, encouraging community participation and influencing future projects.

Art Displays— MURALISM, DIGITAL ARTS, AND CULTURAL EVENTS

- Artistic Interventions
- Physical and Digital Pieces
- Organization of Public Events

Technical Consulting — WORKSHOPS AND OUTREACH

- Provide a description of the work done and a contextualization of the creative process, influencing future artistic works.
- Conferences
- Workshops
- University Presence

Digital Solutions — APP ARCHITECTURE AND CLOUD TECHNOLOGY

- Our integrated solutions services are based on the implementation of mobile technologies in different architectural spaces. This includes the development and management of physical networks, smart installations and applications, among other services.
- Information campaigns
- Optimized internal communications
- Competitiveness with institutions at the international level
- Modernization

Art Displays

The physical and digital pieces are exclusive to each piece and are combined integrally. The team's proposals consist of the original creation of the previously mentioned artwork, followed by a contextualization process through an audiovisual experience with the use of augmented reality, smart technology, virtual galleries, and video mapping on-site. Our physical intervention is not limited to murals. The collaboration of our team allows us to propose a variety of physical interventions such as sculptures, stained glass, lighting, and permanent projectors, among other solutions.

Muralism and the Physical Environment

Painting is used as a medium to encode and extend the dimensions with which mathematics and natural sciences are expressed. The use of colors and geometric patterns in 2D and 3D provides a high degree of freedom in expressing logical-mathematical concepts. The proposed mural will have the following characteristics:

- Symbolize the agreed-upon theme
- Be permanent
- Contain digital implementation of an app
- Be displayed during an inaugural event
- Workshops and talks for the public

Smart Mural is a merge of art and science, aiming to highlight the close relationship between both activities. Painting is a medium for coding and extending the dimensions through which mathematics is expressed. Proposals for paintings and sculptures are created in an effort to define a pure mathematical language that uses elements of chromatic theory and geometry, algebraic relations and self-replication, replacing the usual mathematical symbols.

Artistic interpretations are made by using the chromatic color scale to represent the numerical order, resulting in a mathematical table composed of geometric relationships between colors. This mathematical modeling is translated into various artistic and technological disciplines such as painting, sound design, animation, video mapping, and augmented reality. The production of the visual and sound pieces is exclusive and based on the same mathematical patterns to achieve true synchronicity in their creation, so that analog information is captured through different senses. The video mapping applied to the mural and architectural spaces includes various techniques like 2D and 3D animation, video editing, photography, stop motion, etc.

A Smart Mural was painted at the Center for Exact Sciences and Engineering of the University of Guadalajara, Mexico. The artwork represents six natural sciences relevant to the research and studies applied there and it displays elements of Physics (purple), Chemistry (blue), Biology (green), Human Anatomy (yellow), Molecular Structures (orange), and Electrical Circuits (red). Logical-mathematical thinking, represented by all the colors in the center, unifies the other six. The six outer hexagons are a symmetric copy of the central section, and each presents a different characteristic structure, under normal and fluorescent light.

Underlying this design is a graphical representation of structures and numerical operations. This is achieved by assigning colors to numbers in a mathematical table. The chromatic scale of the colors represents the linear order of integers, and the structure of the mural encodes algebraic relationships.

Digital Arts

The team works in multidisciplinary collaboration to create an immersive environment around physical art pieces and spaces, using various elements and artistic expressions and complementing them with mobile technology and augmented reality to enhance functionality and user experience.

To achieve real synchronization between the different forms of expression, we use technological resources developed by the team and employ all media as expressive tools to create a complete sensory experience. We propose the creation of thematic murals, each complemented by an exclusive production of digital arts that enhances the theme of the physical piece through a series of Video Mapping projections, which can later be reproduced from a smartphone.

- **Video Mapping:** Consisting of 2D and 3D animation displayed with light projectors on real surfaces. Video mapping includes various techniques and methods such as 2D and 3D animation, video editing, photography, stop-motion, etc. It is a proposal for abstract cinema and audiovisual digital textures by the creative team.
- **Sound Design:** The acoustic environment designed for the video mapping is original and exclusively produced for each piece, keeping in mind the desired effects for each case.
- **Augmented Reality and Mobile Technology:** By combining art and technology, an interactive experience is created between the audience and the artwork. Augmented Reality brings the mural to life during and after the projections. This opens a virtual space that can be used to disseminate information to the community and launch other platforms from a digital twin of the center, virtual classrooms, universal digital signage, virtual tours, virtual bulletin boards, and even virtual reality environments for classes (Labs and Virtual Classrooms, etc.).
- **Kinetic Music:** An innovative proposal consisting of kiosks with motion sensors, pendulums, laser lights, and other elements to create and synchronize an interactive sound sculpture. These installations can be left on-site for the public to interact with.
- **Electro-Acoustic Stage:** A well-coordinated combination of various elements. It includes music generated by electronic sequences, live musicians, video mapping, dance company, and live art.

An environment where modern technologies coexist and preserve art and culture is achieved through a series of interactive and immersive scenarios where the audience can become part of the artwork. This experience can range from a Kinetic Music setup to the Electro-Acoustic Stage, or even beyond with Augmented Reality (AR) and Virtual Reality (VR) environments. By combining these different elements, we create an immersive experience that allows audience interaction.

Technical Consultancy

Before and during the premiere of the show, cultural activities are organized to contextualize the artwork and digital media as an expressive medium and provide a description of the creative process, influencing future artistic works.

For example, for University Campuses, we propose an Art, Science, and Technology Week consisting of a series of activities to integrate knowledge from different fields. This is achieved through art exhibitions, conferences, workshops, roundtables, and cultural events where students and teachers have the opportunity to interact in an environment of academic and artistic interdisciplinary creativity. For this purpose, we hold workshops on the methods implemented, with the goal of helping to understand the new communication and expression pathways emerging from interdisciplinarity.

- **Geometry and Design:** Geometry is an essential tool for designers and visual artists. We design workshops with practical applications in visual arts.
- **Mathematics and Painting:** Painting has undergone great changes linked to the development of geometry and other mathematical elements.
- **Mathematics in Art:** The connection between mathematics and art becomes more apparent in the modern context.
- **Technologies in Art:** There is a close relationship between the arts and the technological media of each time. We offer workshops that encourage the development of technologies in the arts and other creative processes.
- **Creative Programming:** Activities are offered around the application of computer science to the arts.
- **Signals, Data, and Music:** Music is an art whose development has always been closely linked to the development of technologies.
- **Technologies in Social Processes and Community Integration:** Mobile applications are a new medium for interaction in public spaces, providing new ways to merge art and technology through mobile devices like phones and tablets.

Student participation is one of the project's goals. Students will learn to combine areas of knowledge offered in their learning center with different forms of artistic expression. The murals we offer are aimed at developing a new way of understanding and expressing the sciences and arts. By fostering interdisciplinary creativity, we hope to enrich the academic and cultural experience of the university community.

The general theory of systems is an important means of stimulating the transfer of principles from one field to another by developing unifying principles that run vertically through the universe of science. This focus is the center of our philosophy for problem solving and we like to make these principles present in our artwork also. Some of the topics that we, as a team, like to formalize are

SURROUNDED BY NUMBERS. In nature, there are relationships between processes that follow certain fixed patterns. This type of behavior is what we call a Constant of Nature. Throughout space, these relationships with numerical interpretation resonate and make our world function in the way we know it. The team's research effort has led to natural representations of mathematical systems and, particularly, to the most common mathematical systems. That is, a way to encode mathematical relationships in a system of symbols from which the specific meaning of the expression can be deduced from the structure and geometric relations. Therefore, the research work involves the use of plastic, digital arts, and technologies as a means to communicate formal expressions of scientific knowledge.

FRACTALS IN NATURE. The world exhibits structural uniformity at its different levels or realms; uniformities between different levels of reality. That is, there are properties that remain consistent across all scales of nature. We are talking about a principle that generalizes the concept of a fractal structure. These are systems in which an equation that describes the behavior of the entire system has the same form as equations describing the behavior of the individual elements. Partial processes can be overlapped to obtain the total process. The monumental mural piece is constituted by the principles of self-replication, algebraic mesh, and colorimetry. Through the manipulation of the colors used, the algebraic mesh is painted to reveal the structure of the systems, achieving an artistic perception. The parameters for generating the fractal structure of the figure can be the angle of bifurcation, the point of bifurcation, and the scale of the copy. Successive iterations generate the sense of depth in the artwork.

SOUND ART. The creation of an oscillator bank consisting of wave tables obtained from the angular relationship of the fractal on which the design is based. This utilizes a series of related synthesis techniques, all based on the idea that complex tones can be created by adding simpler tones together. To develop this project, three fundamental wave tables will be generated, the basic cells of the auditory piece, based on three elementary functions: sine, triangular, and square.

Digital Solutions

An important part of the project is the final stage, where it is proposed that the public have access to the digital piece after its premiere. This is achieved through the implementation of smart technology, promoting new ways of dissemination and access to relevant information within the community. Additionally, mobile technology modernizes how information is shared in different public spaces. With the guarantee of generating a necessary user community by creating spaces for cultural exchange, we offer an inaugural event. Digital arts are expanded into virtual spaces that enhance the functionality of the environment. Physical spaces are complemented with virtual environments, either with private keys and/or public access, with directed or restricted content, and located in different physical spaces. Platforms can be made available via mobile devices, screens, etc. This creates a medium for presenting and projecting new enhancements, renewing their use and emphasizing their existence to new generations of users.

Architectural spaces will increasingly depend on digital and mobile technology. Our workgroup helps to make the transition, in the learning curve generated by the application of these technologies, efficient and continuous by reaching a diverse audience through common technologies like mobile devices and Augmented Reality (AR). This process amplifies and perpetuates the artistic and cultural experiences through the virtual interface, opening the door to a series of technological enhancements that can improve functionality of the space.

We strengthen our work by collaborating with experts from diverse fields to provide comprehensive solutions to a wide range of challenges. Among the projects that can be followed up, with university departments and other spaces, are:

- Virtual Classrooms
- Digital Bulletin Boards and Announcements
- Community Integration
- User Information
- Entrance Control with Registration and Personal Identification for the Institution
- Cultural Spaces (Physical and Virtual)
- Universal Digital Signage
- Electronic Guide
- Product Check-outs via App (library, laboratories, etc.)
- Virtual Gallery, Augmented Reality, and Virtual Spaces
- Virtual Tours

JUAN PABLO RAMÍREZ

PHONE NUMBERS:

+1 (708) 945 - 4477

EMAIL AND PERSONAL PAGE:

jramirez@binaryprojx.com
www.binaryprojx.com

ADDRESS:

Guadalajara, Jalisco, México

EDUCATION

UNIVERSIDAD DE GUADALAJARA

2008 - 2011, Guadalajara, México

- Teaching experience
- Served in panels for updating academic programs in Natural Sciences and Engineering
- Developing and solving mathematical models for Theoretical Physics, with Dr. Georgi Pogosyan of the International Center for Advanced Studies and the Joint Institute for Nuclear Research
- Applied Mathematics with Dr. Alexander Yakhnov, from the Dept. of Mathematics
- Project managing and Director of events such as workshops and "Art and Science Week"

UNIVERSIDAD DE GUANAJUATO Y CENTRO DE INVESTIGACIÓN EN MATEMÁTICAS (CIMAT)

2011 - 2013, Cd. Guanajuato, México

- Research presented at area-specific conferences and seminars
- Activities divulging mathematical sciences

PROFESSIONAL EXPERIENCE

- Speaker at International Conferences and Symposiums
- Participation and Leadership in academic and industrial research and application programs
- Project Management for high-level to low-level language software projects
- Software Architecture for applications in finance

LANGUAGES

English
Spanish
C++
Python

RESEARCH AREAS

Mathematics

Physics

Computer Sciences

RESEARCH TOPICS

- General Theory of Systems
- Axiomatic Basis and Mathematical Foundations
- Numeric Solutions
- Recursivity
- ALU Architecture
- Computability and Complexity
- Category Theory
- Logical Systems
- Formal Systems and Languages
- Mathematical Analysis
- Cryptography and Homomorphic Encryption
- among other related topics.

PARTICIPATIONS

- "Recursive Solutions for Constant Coefficient Differential Equations". Physical-Mathematical Sciences Week, Universidad de Guadalajara, 2010.
- "Axiomatic Basis for Probability". Second School on Logic and Sets, UNAM campus Morelia, 2013.
- "General Theory of Systems and Algebraic Structures". Physical-Mathematical Sciences Week, Universidad de Guadalajara, 2017.
- "A Natural Construction of Real Numbers". Physical-Mathematical Sciences Week, Universidad de Guadalajara, 2017.
- Workshop on "Mathematics and Paint". Physical-Mathematical Sciences Week, Universidad de Guadalajara, 2018.
- "Topologies of N in the Construction of R". Physical-Mathematical Sciences Week, Universidad de Guadalajara, 2018.
- Organization and Direction of "Art and Sciences Week", including workshops, conferences, roundtables and creation of Smart Mural (Universidad de Guadalajara, 2018, 2022, 2024).
- Workshop on "Higher Order Derivatives for Solving Partial Fractions and their Applications". XIII Encuentro de Especialistas del Norte de Jalisco y Sur de Zacatecas, 2018.
- "The Nature of Numbers". Logic and Foundations Special Session, 52 Mexican Congress of Mathematics, Monterrey, Nuevo León, 2019.
- "The Nature of Numbers". Universidad de Guanajuato/CIMAT, 2019.
- Chicago Quantum Summit. University of Chicago, 2020.
- Smart Mural. Inauguration of 55 Mexican Congress of Mathematics, 2022.
- "Canonical Block Form for Finite Groups". Algebra Special Session, 55 Mexican Congress of Mathematics, Guadalajara, Jalisco, 2022.
- "Simple and Linear Fast Adder based on a Simple Representation of Natural and Real Numbers". Computer Science Special Session, 55 Mexican Congress of Mathematics, Guadalajara, Jalisco, 2022.
- "Simple Representation of Natural and Real Numbers". Logic and Foundations Special Sessions, 55 Mexican Congress of Mathematics, Guadalajara, Jalisco, 2022.
- "A Pseudo Measure on the Space of Finite Functions and Permutations". Algebra Special Sessions, 56 Mexican Congress of Mathematics, San Luis Potosí, 2023.
- "An Algorithm for Fast Multiplication and Addition of Multiple Inputs and It's Implementation for In-Memory-Computing". Computer Science Special Sessions, 56 Mexican Congress of Mathematics, San Luis Potosí, 2023.
- "Simple and Linear Fast Adder of Multiple Inputs and It's Implementation for a Compute-In-Memory Architecture". International Conference on Artificial Intelligence, Computer, Data Sciences and Applications, 1-2 February 2024, Victoria-Seychelles.
- "Programming Random Change of Variables for Homomorphic Encryption". Modern Methods, Means and Technologies of Information Protection (timed to coincide with the 90th anniversary of its founder, Professor Oleg Borisovich Makarevich, on September 11-15th, Taganrog, Russia.

PUBLICATIONS

- Ramirez, J. 2024. "Programming Random Change of Variables for Homomorphic Encryption". Report on my participation in "Modern Methods, Means and Technologies of Information Protection" 2024 international conference soon available.
- Ramirez, J. 2024. "Programming Random Change of Variables for Homomorphic Encryption". Full White Paper Exclusively on Author's personal page: www.binaryprojx.com
- J. P. Ramírez, "Simple and Linear Fast Adder of Multiple Inputs and Its Implementation in a Compute-In-Memory Architecture," 2024 International Conference on Artificial Intelligence, Computer, Data Sciences and Applications (ACDSA), Victoria, Seychelles, 2024, pp. 1-11, doi: 10.1109/ACDSA59508.2024.10467957.
- Ramirez, J. "SIMPLE AND LINEAR FAST ADDER," WIPO, Patentscope. Publication Number: WO/2023/220537. Publication Date: 16/11/2023. Applicant's and Inventor's name: Juan Pablo Ramirez
- Ramirez, J. 2023. "Canonical Set Theory with Applications from Matrix Operations and Data Structures to Homomorphic Encryption" Monograph Exclusively on Author's personal home page: www.binaryprojx.com
- J. P. Ramírez. "A New Set Theory for Analysis," Axioms. 2019. 8, no. 1: 31. https://doi.org/10.3390/axioms8010031. Cited by Lovyagin (2021) on the topic of Finite Arithmetic and Non-Standard Analysis for Hyperrationals with Applications to AI.
- Ramírez, J., Londoño W., et. al. "Closed Solution for Partial Fractions" Boletín Redipe, ISSN-e 2256-1536, Vol. 7, Nº. 11, 2018 (Special issue dedicated to: Pedagogical value of the media), págs. 172-178
- Ramirez, J. 2015. Systems and Categories. arXiv:1509.03649v5 [math.CT]

CURRENT PROJECTS

I am seeking to develop critical applications, of the mathematical framework I propose, in computer sciences at a software and hardware level ranging from significant optimizations in the representations of numbers and operations, to the algorithms that process and share confidential data. To this end, I have started a Research and Development organization, "OPERACIONES DIGITALES Y PROCESAMIENTO INTEGRAL DE DATOS ENCRIPTADOS, SAS" incorporated in Mexico, that studies and integrates mathematical efficiency from a new standpoint that is proving to yield numerous advantages across applications in natural sciences, mathematics and computer sciences.

Currently, my main goals are to continue to establish new collaboration and partnering for development on industry level applications. These include a Simple and Linear Fast Adder that has a scalable design with constant topological complexity and linear growth with respect to the number of input bits, and which can be implemented in a Compute-In-Memory architecture (PCT patent-pending). Another direct application of my research includes a Homomorphic Encryption scheme that allows encrypted data to be processed, without decrypting it first, with numerous applications including AI training with sensitive data. Other interests include development of software and mathematical models for semi supervised algorithmic trading based on technical analysis.

I have also led and produced art and cultural events merging augmented reality and mobile technologies that introduce virtual enhancements to public spaces through the implementation of smart technology and mobile devices. I Conceptualized and led the development of the "Smart Mural" project, an innovative fusion of art, science, and technology, that implemented interactive murals incorporating augmented reality (AR), video mapping, and algorithmic art to visually encode scientific and mathematical principles. I worked with multidisciplinary teams to create and integrate digital arts and platforms, enhance community engagement, and modernize architectural spaces through technology-driven solutions. Academic workshops and public exhibitions have been organized to promote the intersection of digital arts, STEM education, and cultural enrichment, while fostering creativity and interdisciplinary collaboration in future projects.

UNIVERSIDAD DE GUADALAJARA

CENTRO UNIVERSITARIO DE CIENCIAS EXACTAS E INGENIERIAS / SECRETARIA ADMINISTRATIVA

CUCEI/SAD/AT/143/2018

A quien corresponda
P r e s e n t e.

Por medio de la presente, se hace constar que en el Centro Universitario de Ciencias Exactas e Ingenierías de la Universidad de Guadalajara se ha realizado un mural artístico hecho con modelación matemática. El mural fue complementado con una obra audiovisual de las artes digitales; el equipo produjo música y animaciones exclusivas para el mural que se expusieron en video mapping. Este ambiente digital se puede volver a reproducir en forma de realidad aumentada desde un smartphone, utilizando la aplicación Riggo, ya disponible en Appstore. El video mapping se llevó a cabo en dos días distintos de la Semana de Arte y Ciencia (17-20 abril en CUCEI); esta semana fue organizada por el equipo del proyecto Mural Inteligente, y consistió de conferencias, talleres, mesa redonda, performance y video mapping. Las conferencias y talleres fueron planeados en el marco de una integración de las disciplinas que manejan los integrantes del equipo. Haciéndose así, una verdadera unión entre las artes, las ciencias y la tecnología. Los temas eran de selección interdisciplinaria y creatividad artística en la expresión de la ciencia y expone las ventajas de la combinación de disciplinas.

Expresamos nuestra total conformidad en la planeación, ejecución y manejo del evento SAC (Semana de Arte y Ciencia) y sus actividades. El equipo de Mural Inteligente demostró su ética y profesionalismo en todo momento, así como su capacidad para resolver los retos y peticiones de nuestra institución. El C. Juan Pablo Ramírez Ramírez fue autor de la obra mural monumental y Director General de Proyecto, El Ing. Ricardo Gutierrez como Director de Artes Digitales, mientras que el C. Cesar Antonio Ricardo Jiménez Dávalos fue Director de Desarrollo de Software. Se hace constar el buen funcionamiento de su equipo para la solución creativa a obras de índole interdisciplinaria en las áreas de Artes, Ciencias y Tecnologías. Sin más por el momento quedo a sus órdenes para cualquier aclaración o validación de lo aquí establecido.

Así mismo, expresamos nuestro apoyo para la realización de talleres y conferencias en nuestras instalaciones, en caso de ser considerado el Festival de Arte, Ciencia y Tecnología (FACT).

A t e n t a m e n t e,
"Piensa y Trabaja"
Guadalajara, Jal., 11 de mayo de 2018

CENTRO UNIVERSITARIO DE CIENCIAS EXACTAS E INGENIERIAS
SECRETARÍA ADMINISTRATIVA

Mtro. Jaime Gutierrez Chávez
Secretario Administrativo

Archivo/JGC/lgj

El CUCEI cuenta con su primer Mural Interactivo

Con el objetivo de combinar el arte con la ciencia, alumnos y egresados del Centro Universitario de Ciencias Exactas e Ingenierías (CUCEI), realizaron un proyecto innovador que consiste en el desarrollo de un video *mapping* proyectado a través de un Mural Inteligente.

Juan Pablo Ramírez, Ricardo Gutiérrez Aguilar, César Antonio Ricardo Jiménez Dávalos, Carlos Infante y Marcos Hernandez, utilizan patrones matemáticos, medios artísticos como el color, los tonos y medios tecnológicos para representar conceptos científicos que son plasmados en una tabla matemática en colores.

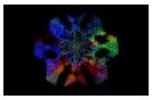
El video *mapping* se utiliza para realizar proyecciones sobre edificios históricos, esta actividad se ha realizado en todo el mundo en países como Bélgica, Holanda y Alemania, entre otras y en México ha tenido presencia en edificios como Bellas Artes y la Catedral metropolitana de la ciudad de México, así como en los estados de San Luis Potosí, Morelia, Cancún, Puebla y Jalisco, entre otros.

Una vez concluido el diseño visual de los Patrones matemáticos a plasmar, el proyecto fue presentado a la Dra. Ruth Padilla Muñoz, Rectora del CUCEI, al Mtro. Jaime Gutiérrez Chávez, Secretario Administrativo y al Dr. Marco Antonio Pérez Cisneros, Director de la División de Electrónica y Computación, quienes apoyaron la idea de complementar dicha pieza no solo como un mural pintado sino con expresiones visuales y musicales para que fuera un mural interactivo.

En la presentación del mural inteligente que se encuentra ubicado en la parte posterior del Centro Integral de Documentación (CID) del CUCEI, se utilizó un proyector de gran formato para abarcar la dimensión del mural que son aproximadamente 10m x 10m y para la implementación de las imágenes del espectáculo se realizó la proyección del video con realidad aumentada que puede ser reproducida desde la pantalla de un Smartphone.

Es una actividad multidisciplinaria, como un medio de comunicación y expresión del alumnado, con una aplicación a través de sus Smartphones, explicó Juan Ramírez: "nos extenderá las oportunidades de usarla en otras actividades académicas, de tal manera que pueda ser una plataforma virtual para que los alumnos estén compartiendo información entre ellos y enriqueciendo avisos".

Videos



Colaboradores del mural interactivo

- **Juan Pablo Ramírez**, estudiante de la Licenciatura en Física, (CUCEI), Director general del proyecto y Diseño de la pintura del mural.
- **Ricardo Gutiérrez Aguilar**, egresado de la carrera de Ingeniería en Electrónica (CUCEI) y productor de sonido.
- **César Antonio Ricardo Jiménez Dávalos**, estudiante de Nanotecnología en la Universidad Técnica de Viena y creador de la aplicación
- **Carlos Infante** egresado del Centro Universitario de Arte Arquitectura y Diseño CUAAD y **Marcos Hernandez** Licenciado en Psicología de España, creadores del material visual

Los estudiantes mencionaron que existe la posibilidad de implementar, en otros dos edificios del CUCEI, murales interactivos.

Responsable:
Unidad de Difusión
Texto:
Luz Gabriela Angulo Reyes
Fotógrafo:
Abel Hernández
Editor:
Cristina Neri cortés

SITEUR
SISTEMA DE TREN ELÉCTRICO URBANO

A quien corresponda:

Por medio del presente, hago constar que el Lic. Carlos Rodolfo Infante Lujan, se presentó en éste Organismo con la tentativa de llevar a cabo el proyecto denominado "F.A.C.T. (Festival de Arte, Ciencia y Tecnologia)", el cual nos refiere es uno de los proyectos candidatos a recibir un apoyo por parte del FONCA, en la convocatoria denominada "Arte, Ciencia y Tecnología 2018".

Cabe mencionar que en anteriores ocasiones, el Lic. Carlos Infante ya ha colaborado con nosotros, desarrollando en el mes de marzo de 2018 el proyecto "Ciudad Latente", consistente en la realización de un festival de videomapping urbano con cede en 6 diferentes estaciones del tren ligero.

Por lo anterior, hacemos de su conocimiento que en caso de que el proyecto "F.A.C.T." reciba el apoyo mencionado, la actual Jefatura de Fomento a la Cultura del SITERU no tiene ningún inconveniente en que se realicen las actividades necesarias en las instalaciones de éste organismo para llevarlo a cabo, así como brindar en la medida de las posibilidades apoyo en la logística y producción, siempre y cuando se programen con anticipación y se obtengan los vistos buenos de la Dirección General.

Lo anterior, para los efectos a que haya lugar.

Atentamente

Lic. Sergio Torrecilla Adame
Jefe de Fomento a la Cultura

GDLUZ FESTIVAL 2018

Lunes 7 de mayo de 2018

A quien corresponda:

Por medio de la presente me permito recomendar ampliamente al señor Carlos Rodolfo Infante Luján quien colaboró en el festival GDLUZ 2018 en el área de proyección y montaje.

Sirva la presente como constancia de su responsabilidad, compromiso, talento, ética y buena disposición para hacer las cosas de manera asertiva y en el tiempo correspondiente.

agradeciendo de antemano sus atenciones, se extiende la presente para los efectos legales que al interesado convenga.

ATENTAMENTE

Tania Cortés
COO

alteacorp

Universidad de Guadalajara

Centro Universitario de Arte, Arquitectura y Diseño

Secretaría de Vinculación y Difusión Cultural

Coordinación de Artes Escénicas

ARTES ESCÉNICAS

A quien corresponda
PRESENTE.

Por medio de la presente, les comunicamos que la Coordinación de Artes Escénicas y Literatura de la Universidad de Guadalajara, está considerando al proyecto FACT (Festival de Arte, Ciencia y Tecnología), con un espacio de presentación y talleres en el Teatro Vivian Blumenthal, en caso de verse beneficiados con el apoyo del PROGRAMA ARTE, CIENCIA Y TECNOLOGIAS (ACT). SECRETARÌA DE CULTURA-UNIVERSIDAD AUTÒNOMA DE MÈXICO.

Las presentaciones serán acordadas según la disponibilidad del inmueble.

Así mismo notificamos que esta coordinación conoce la trayectoria de Ricardo Gutiérrez Aguilar y su equipo de trabajo. Por lo que impulsamos la creación del proyecto FACT considerándolo como una propuesta artística de vanguardia latinoamericana.

Sin más por el momento, quedo de ustedes para cualquier duda y aclaración como titular de la dependencia.

Atentamente
"Piensa y trabaja"
Guadalajara, Jalisco, a 10 de mayo de 2018

Lic. Daniela Yoffe Zonana
Coordinadora

COORDINACIÓN DE PRODUCCIÓN Y DIFUSIÓN DE ARTES ESCÉNICAS Y LITERATURA

Simón Bolívar no. 194,
Colonia Lafayette
C.P. 44160 Guadalajara,
Jalisco, México.
Tel: 01 (33) 1380 0382
www.artesescenicasudg.mx

CUCEI/DPTO.MAT/0296/2022

A quien corresponda. –
Presente. -

Por medio de la presente se hace constar que en el Centro Universitario de Ciencias Exactas e Ingenierías de la Universidad de Guadalajara se ha realizado una segunda proyección del mural artístico, Mural inteligente. El mural fue complementado con una obra audiovisual de las artes digitales, con música y animaciones adaptadas de manera exclusiva para las actividades del 55 Congreso Nacional de la Sociedad Matemática Mexicana (55 CNSMM), que se celebró del 24 al 28 de octubre del 2022, en las instalaciones del Centro.

El video mapping se llevó a cabo el día lunes 24 de octubre como parte de las actividades del congreso y fue organizado por el equipo de Mural Inteligente, en coordinación con el Departamento de Matemáticas y el Comité organizador del 55 CNSMM. Expresamos nuestra total conformidad en la planeación, ejecución y manejo del evento y sus actividades. El equipo de Mural Inteligente demostró su ética y profesionalismo en todo momento, así como su capacidad para resolver los retos y peticiones para la exitosa realización del evento. Se hace constar que el C. **Juan Pablo Ramírez Ramírez**, autor de la obra y Director General del proyecto, donó en especie la proyección y remasterización y adaptación de la temática del Mural Inteligente para el 55 CNSMM. Así mismo se hace notar el buen funcionamiento de su equipo para la solución creativa a obras de índole interdisciplinaria en las áreas de Artes, Ciencias y Tecnologías.

Sin más por el momento quedo a sus órdenes para cualquier aclaración o validación de lo aquí establecido.

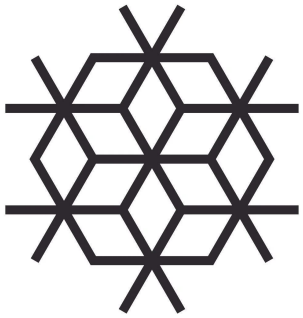
ATENTAMENTE
Piensa y Trabaja"
"2022 Guadalajara, hogar de la Feria Internacional del Libro y Capital Mundial del Libro"
Guadalajara, Jal. a 25 de noviembre de 2022

Dra. Emilia Fregoso Becerra
Jefa del Departamento de Matemáticas

UNIVERSIDAD DE GUADALAJARA
Centro Universitario de Ciencias Exactas e Ingeniería
Departamento de Matemáticas

EFB/gnf

c.c.p. Archivo



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