

Caring for collections in tropical environments: collecting and communicating data at Museu Paulista/USP, Brasil (1997-2000)¹

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Museu Paulista da USP

Introduction

The environmental data recorded since 1997 at Museu Paulista, Universidade de São Paulo, Brazil, is part of the "Museum Environmental Plan", a research project begun in 1996 and still in progress. The plan has as main objectives:

- to improve understanding the museum environmental conditions;
- to research, learn and compare the environmental conditions inside and outside the building;
- to develop a simple way of presenting this data so it could be used by all museum staff, researchers in general, graduate students and museums inside or outside Brazil;
- to help the museum staff plan their activities;
- to manage the collections preservation by studying each area individually, proposing changes when necessary;
- to contribute with other institutions by divulging our experience, problems and solutions;
- to contribute with the study of collections management in tropical countries².

The museum and the city of São Paulo

Museu Paulista da Universidade de São Paulo is known all over Brazil as the "Independence Museum". It is one of the most visited sites in the country and one of São Paulo's largest museums. The *Museu Paulista*, which is one of the four

1. This project would not exist without the hard work of Christine May Kauffmann Fidalgo (graphic designer, *Museu Paulista*); Alexandre Henrique da Silva (graduation student scholar 2001-2003, author of *Cartas Climáticas*); Lincoln Seiji Tejima (graduation student scholar 2000-2001 author of *Plantas temáticas*); Dinah Eastop (The Textile Conservation Centre, University of Southampton, UK) and Prof. Dr. Tarik Rezende de Azevedo from the *Laboratório de Climatologia e Biogeografia do Departamento de Geografia da FFLCH/USP* - who joined the project in 2002.

2. All the equipment described was sponsored by FAPESP, *Fundação de Amparo à Pesquisa do Estado de São Paulo*.

3. The other museums of the Universidade de São Paulo are: MAC - *Museu de Arte Contemporânea*, MAE - *Museu de Arqueologia e Etnologia* and MZ - *Museu de Zoologia*.

museums of the University of São Paulo³, is a social history museum located inside a park (FIGURE 1). The park has three different sections: the Independence group of statues, the French garden and fountain, all in the front side, and the grove at the back. The building that houses the museum is a 19th century neoclassical construction with open terraces and large halls (FIGURES 2-4).

When entering the museum one notices, almost immediately, that the environmental conditions outside and inside the building seem to be very similar: large open doors, open halls and corridors suggest there are no barriers from the outside climate, especially during rainy seasons, and indicates, as a first consideration, very improper conditions for the preservation of the museum's collections. Since the building is itself a monument and that means, in Brazil, that it cannot be altered, the comprehension of the environmental conditions was considered crucial. This project was conceived to investigate those conditions and highlight the differences, if existent, among the 33 areas monitored.



São Paulo, the third most populated city in the world, is located just by the Capricorn Line, on the "Planalto Atlântico", 700m above sea level and 45 km far from the Atlantic Ocean. Today its 16 million inhabitants share an area of 1.747 Km² in which 3 million vehicles generate 6.000 tons of pollutants every day. The study of São Paulo's climate conditions was considered essential to understand what happens inside the museum during the different seasons of the year. The bibliography available, however, indicated considerable differences when analysing environmental data of the city. An essay – based on that bibliography and on data reports provided by three different climate centres – was produced, balancing all information and considering only part of the data available⁴. Ipiranga – the area where the museum is located, presents a very peculiar climate if compared with other zones of the city of São Paulo: despite the park and the green areas existent, higher temperatures, weak winds, improper conditions for pollutants dispersion and very high concentration of population are some of its specific characteristics (FIGURE 5).

4. The essay was produced by Lincoln Seiji.Teshima "O meio físico da cidade de São Paulo", 2001 ; unpublished.



FIGURE 2 – General view from museum area with building in the back. Photo by José Rosael.



FIGURE 3 – Museu Paulista entrance and main hall. Photo by José Rosael.



FIGURE 4 – Main halls and stairs (left side). Photo by José Rosael.



FIGURE 5 – Open halls on gallery west. Photo by José Rosael.



FIGURE 6 – Archive and storage for photographs. Photo by José Rosael.

Recording relative humidity and temperature data

The places monitored during those four years included six storage facilities, the main entrance hall, the central stairs and all exhibition rooms including corridors. All rooms were monitored by Ratona's thermohygrographers. Since the museum had bought two units of that equipment in the previous years and considering that in 1996, when planning began, dataloggers were not easily available in Brazil, it was decided to invest in more units of the same equipment rather than move to a different supply. One of the advantages considered when choosing thermohygrographers was their "visibility": the data recorded would be visible to both staff and visitors. At that time the staff had to be convinced about the importance of putting the equipment in the rooms and the staff members were invited to cooperate with the project. Before long the data originated by the thermohygrographers started to be observed and compared by staff and also by visitors. Considering that *Museu Paulista* was one of the first museums in São Paulo to monitor collections in a large scale it was crucial that the staff and the public understood what was being done. The security staff started to take care of the equipment and ask frequently for details to better inform the visitors.

The particular problems the project had to be worried about during the four years were: the renewal works on the building; the several changes in

the exhibition rooms and the security of the equipment itself. From 1995 to 2000 the building was completely restored without the need of closing the museum to visitors. To make this possible exhibitions had to be held in turns, some rooms had to be closed while others were under work. It should be mentioned that firstly, restoration plans did not include the exhibition areas, so the risk of equipment and information accuracy were not considered when elaborating the environmental project. The termohygrographers always stayed in place, protected, except for one that invariably followed the coins and medals collections. The changes in the rooms were all recorded and will be considered in all future investigations.

5. The author means that examples of similar classifications in other museums with tropical environments were not found. Stefan Michalski's article "A discussion of correct/incorrect values." published in ICOM-CC 10th Triennial Meeting Preprints was crucial for establishing those levels.

The environmental plans (*plantas temáticas*)

The relative humidity and temperature data recorded during these four years offers us an important opportunity to analyse and understand the impact of those factors in museum collections, and may suggest, also, that museums situated in tropical environments should consider other values when discussing and evaluating their environmental conditions. However, all the information obtained would be useless if museum staff, researchers in general, graduate students and even the general public could not make use of it. Communication was always considered crucial; one of the main issues of the project was to provide information to help the museum staff plan their activities. During the first two years all data was transferred to an Excel[®] program that produced graphs for each one of the rooms. The understanding of the data and the graphs, however, was considered inadequate and confusing by the staff. Links between the graphs and people's working experiences had to be made clear.

To make all the records easily comprehensible to the museum staff, environmental plans were created. Adapting the museum plans and basing the work on geography, physics and architectural patterns, the environmental plans (*plantas temáticas*) were developed with the use of a CorelDRAW 9[®] program. The main criterion used to design the plans was the staff's comprehension. It was crucial that the plans could be easily assimilated and used without the assistance from a conservator.

The most difficult part when elaborating the plans was establishing diverse levels for relative humidity and temperature data. At the *Museu Paulista* relative humidity levels recorded varied from under 30% up to 98% , and temperatures from 12°C to 35°C approximately. What ranges should be classified as improper ones? What range would be considered "proper"? No references about similar classifications were found in the bibliography⁵. Decisions had to be made and it was decided that levels of relative humidity lower than 50% and higher than 80% would be considered improper; in between, two other levels were created. The 50-69% level was considered "proper" or the "good level" and the 70-80% level was considered acceptable. Four different shades of blue were used to indicate the four different levels in the plans. Since relative humidity data should be accentuated more than temperature information, RH numbers were located inside the plan while temperature numbers were positioned inside small bars.

Concerning the temperature, three levels were named: “the proper or the good temperature level” until 24°C; the “bad level” comprising level data between 25°C and 28°C and a “very bad level” including temperatures higher than 28°C. Three different colours were used to indicate the levels: yellow, orange and red. The author never felt comfortable about those classifications but it was assumed that distinctions should be made to the users of the environmental plans. Above all, the plans should point out to the staff which museum areas were better from the conservation point of view, and which ones needed more attention.

After some changes the plans were finally submitted for the museum staff’s evaluation and, since results were considered very successful, a total of 48 plans – one for each month of 1997, 1998, 1999 and 2000 - were produced. Recently, two museum activities involving collections have already planned their actions based on the environmental plans.

The author, besides having all the plans published here, intends to make them available on the web. Many small museums of Brazil have already inquired *Museu Paulista* about those environmental plans; the possibility of developing simple and low cost environmental studies is always mentioned as the main interest. Seminars about environmental studies in tropical climates to museum staff and the general public demonstrate a growing interest in the subject, probably due to the lack of information available in Portuguese and in outside conservation literature.

Understanding the records

Instability in relative humidity and temperature is expected in tropical climates. In the case of São Paulo’s climate, instability might mean, for example, changes in RH from 50% to 80% in few hours. What effects this instability has in the inside areas of the museum is what we want to determine from now on. The impact of these changes on museum objects, however, will not be discussed in the near future. Since the year 2000, the project was elected by the university training program to receive a two-year scholarship. That brought graduate students from the Geography course to work in the museum environmental project, substantially increasing the exchange of information.

The second part of the project – which commenced in 2002 – aims to evaluate the information recorded. Factors such as seasons of the year, climate phenomena like “El Niño” and “La Niña”, ventilation on the different floors, direct contact with external areas, levels of insulation, distances from the park’s vegetation and the park’s fountain, direction of the winds, exposure to external pollution, amount of visitors and duration of their stay in the rooms, and the amount of hygroscopic materials in the rooms monitored, should be carefully considered.

Once communication was identified as the main issue, another type of plan started to be developed. *Carta Climática* an individual plan of each space monitored, in which, besides the RH and the temperature data, information like room’s dimensions and finishings, number of doors, windows etc, collections exposed, recent modifications, visitors’s access, lighting and percentage of hygroscopic materials is shown together.

Conclusion

Brazil is a huge country and climate diversity is one of its characteristics. It is time for museums and research centres in the country to invest more deeply in environmental studies, but also to make conservation information simple and available to the museum community as a whole. Exchange of information and experiences, successful or not, should be stimulated. University museums like *Museu Paulista* can contribute to this exchange by not only divulging the data recorded but also developing, adapting and sharing simple conservation practices.

Acknowledgements

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- . Dinah Eastop (The Textile Conservation Centre, University of Southampton) for her precious comments on this paper and project;
- . Prof. Dr. Tarik Rezende de Azevedo from *Laboratório de Climatologia e Biogeografia do Departamento de Geografia da FFLCH/USP* - who joined the project in 2002;
- . Christine May Kauffman Fidalgo for her technical support and constant encouragement;
- . Alexandre Henrique da Silva, who planned and created all *Cartas Climáticas*;
- . Lincoln Seiji Tejima for his research on São Paulo's climate;
- . Fapesp – *Fundação de Amparo à Pesquisa do Estado de São Paulo*.

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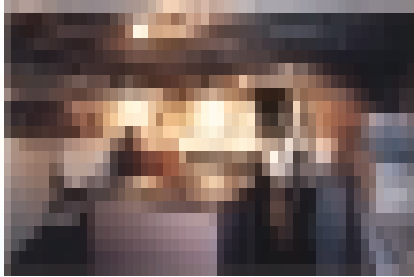
TOMÁS, Denis Dorighello. *Comportamento da umidade relativa do ar em centros urbanos: o exemplo da metrópole de São Paulo*. 1999. Dissertação (Mestrado) – Faculdade de Filosofia, Letras e Ciências Humanas, Universidade de São Paulo, São Paulo, 1999.

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Projeto de Monitoramento Ambiental

Plantas Temáticas e Fichas Técnicas Climáticas

Coordenação geral:	Teresa Cristina Toledo de Paula
Criação dos primeiros gráficos em Excel^R :	Luciano A. Beraldo
Coleta e transferência de dados até 2000:	Teresa Cristina Toledo de Paula
1. Plantas Temáticas – Microclimas do Museu Paulista	
Projeto Gráfico:	Christine May Kaufmann Fidalgo
Concepção:	Lincoln Seiji Tejima Christine May Kaufmann Fidalgo Teresa Cristina Toledo de Paula
Execução e transferência de dados:	Lincoln Seiji Tejima (1997-1999) Alexandre Henrique da Silva (2000)
Assistência em informática:	Leandro Luiz dos Santos Regina Luciano A. Beraldo Tomas Adamavicius
2. Fichas Técnicas Climáticas	
Projeto Gráfico:	Christine May Kaufmann Fidalgo
Concepção:	Alexandre Henrique da Silva Christine May Kaufmann Fidalgo Teresa Cristina Toledo de Paula
Execução e transferência de dados e imagens:	Alexandre Henrique da Silva
Fotografias:	Hélio Nobre José Rosael
Assistência em informática:	Leandro Luiz dos Santos Regina Luciano A. Beraldo Tomas Adamavicius
Observações:	
1. Nem todas as áreas estudadas começaram a ser monitoradas na mesma data;	
2. Algumas informações estão registradas apenas na primeira Planta Temática;	
3. Não existe uma ficha técnica climática para a sala C-7 (fechada) embora ela tenha sido monitorada no período e conste nas Plantas Temáticas;	
4. Todas as áreas com acervo, cujos responsáveis aderiram ao projeto, foram monitoradas.	



Investigación:
 ¿Qué papel juega el agua en el ciclo de vida de un organismo?
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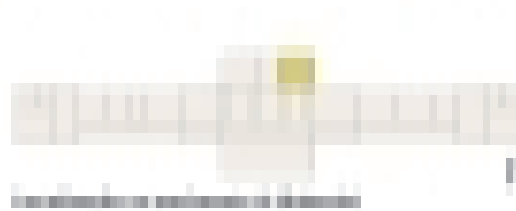


Diagrama de un ciclo de vida con un segmento destacado en amarillo.

Investigación:
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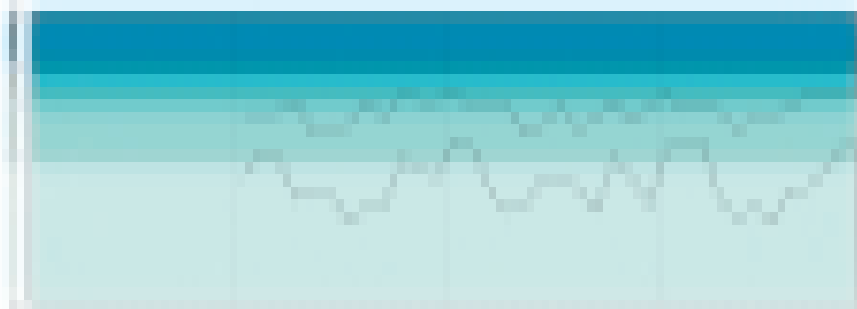


Gráfico de líneas que muestra fluctuaciones de datos a lo largo del tiempo.

¿Qué papel juega el agua en el ciclo de vida de un organismo?



Gráfico de líneas que muestra fluctuaciones de datos a lo largo del tiempo.

**como abren sus ojos
MÁS DE 10 años de vida**



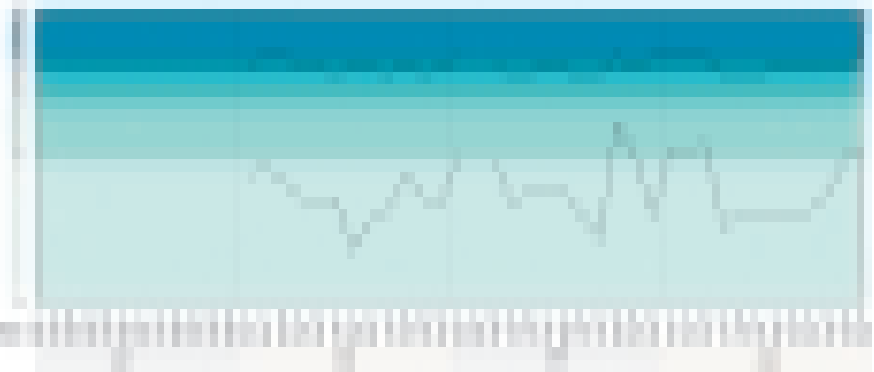
Examen de la retina

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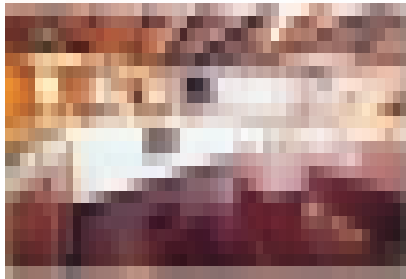
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Examen de la retina y de la retina



Examen de la retina y de la retina





Alcune immagini

Una folla di persone che si raduna davanti al Parlamento di Berlino.

Alcune immagini

Una folla di persone che si raduna davanti al Parlamento di Berlino.

una classifica delle
parti del governo



La classifica dei partiti nel governo

Alcune immagini

Una folla di persone che si raduna davanti al Parlamento di Berlino.

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Alcune immagini

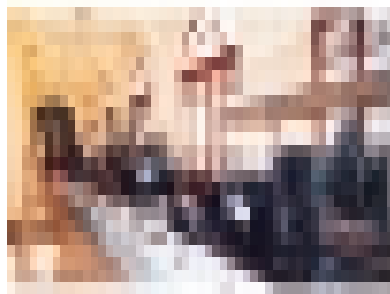


La classifica dei partiti nel governo

Alcune immagini



La classifica dei partiti nel governo



Nome/Spazio:
 Nome e cognome completo, titolo,
 indirizzo e numero di telefono.

Indirizzo Internet:
 Indirizzo e-mail e sito web.

nome cognome completo
 0000 0000 00000000



Indirizzo Internet: nome

Indirizzo:
 Numero: 0000 0000 00000000
 Nome: nome completo
 Cognome: cognome completo
 Indirizzo: 0000 0000 00000000
 Città: 00000000

GRUPPO DI ENERGIE ELETTRICHE DI CARATTERE REGIONALE



GRUPPO DI ENERGIE ELETTRICHE DI CARATTERE REGIONALE





PROVA DI SCIENZE INTEGRATE
MATERIA DI FISICA



Figura 1: Schema di un sistema a vincolo

Domanda: Calcolare la reazione vincolare in B.
Risposta: 100 N

Domanda: Calcolare la reazione vincolare in B.
Risposta: 100 N

Figura 2: Grafico della temperatura in funzione del tempo

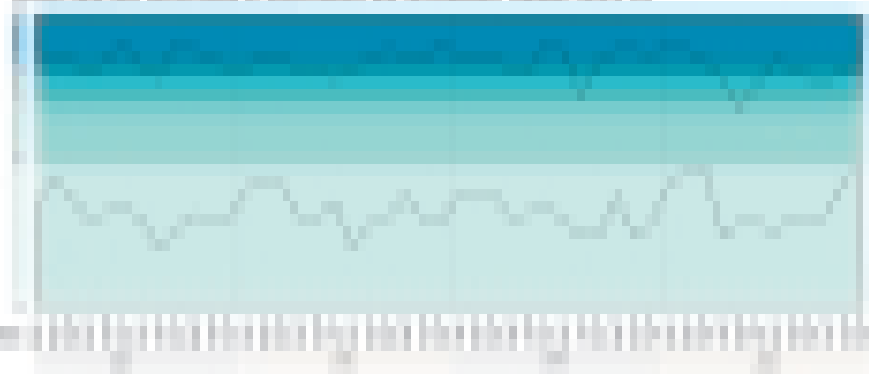


Figura 3: Grafico della temperatura in funzione del tempo





CONTEMPORARY CLASSROOMS SALA D'ATTI CONTEMPORANEA



CONTEMPORANEA (PUNTO DI VISTA)

DESCRIZIONE

PROGETTO PER LA REALIZZAZIONE DI UNA SALA D'ATTI CONTEMPORANEA, ADIBITA A SALA D'ATTI PER LE RIUNIONI E LE INIZIATIVE.

DESCRIZIONE STRUTTURALE

STRUTTURA IN CEMENTO ARMATO CON PAVIMENTO IN CERAMICA E TAVOLE.

DESCRIZIONE

STRUTTURA IN CEMENTO ARMATO CON PAVIMENTO IN CERAMICA E TAVOLE.

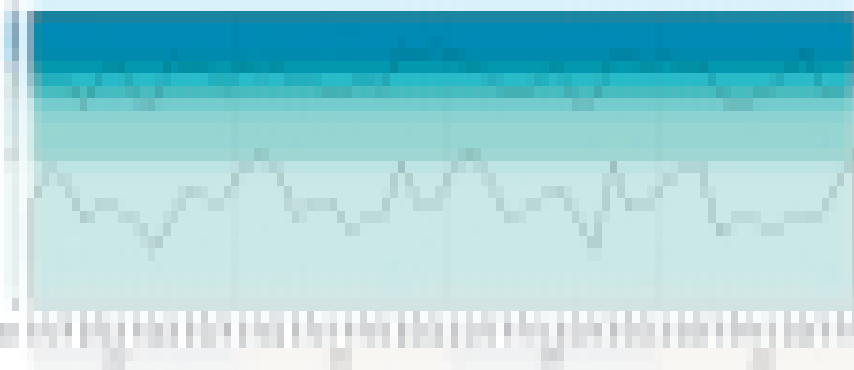
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STRUTTURA IN CEMENTO ARMATO CON PAVIMENTO IN CERAMICA E TAVOLE



STRUTTURA IN CEMENTO ARMATO CON PAVIMENTO IN CERAMICA E TAVOLE





some common conditions
that can occur in the system



Diagram illustrating a common condition in the system

System Overview:
The system consists of a generator connected to a busbar, which is then connected to a load. The generator is controlled by a governor, and the load is controlled by a controller.

Common Conditions:
The system can experience several common conditions, such as a change in load, a change in generator output, or a fault in the system.

Conditions:

- 1. Change in load
- 2. Change in generator output
- 3. Fault in the system

Diagram illustrating a common condition in the system

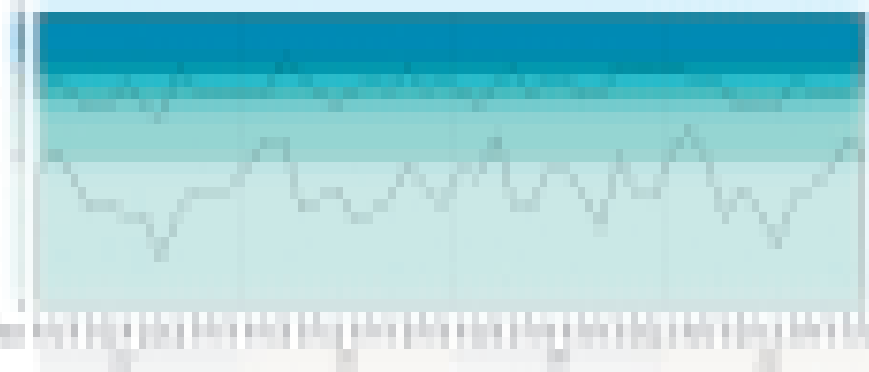
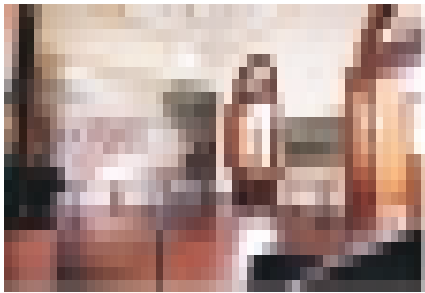


Diagram illustrating a common condition in the system





PROVA DE CONHECIMENTO DE FARMACOLOGIA



Diagrama de localização do coração e pulmões

Objetivo

Identificar os efeitos farmacológicos de um fármaco em um sistema fisiológico.

Introdução Teórica

Os fármacos atuam no organismo através de mecanismos de ação específicos.

Esses mecanismos podem ser diretos ou indiretos.

Metodologia

Utilização de um modelo animal para a administração do fármaco.

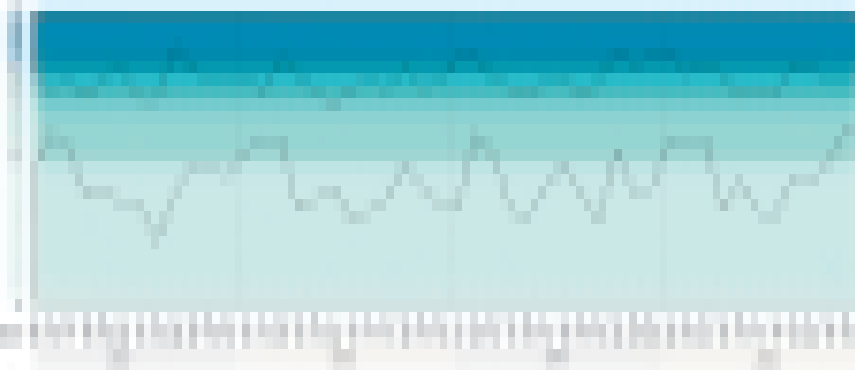
Observação dos efeitos farmacológicos.

Registro dos dados e análise dos resultados.

Elaboração de um relatório final sobre o experimento.

Discussão dos resultados e conclusão do trabalho.

ANÁLISE DE DADOS E RESULTADOS DE TEMPERATURA (°C)



ANÁLISE DE DADOS E RESULTADOS DE TEMPERATURA (°C)





ANALISIS DE DATOS



Gráfico de barras de ejemplo

Resumen Ejecutivo

Este informe resume los resultados de los análisis de datos.

Los datos fueron recolectados de fuentes confiables y procesados cuidadosamente.

Los resultados indican una tendencia positiva en el tiempo.

Metodología

Se utilizaron métodos estadísticos avanzados para analizar los datos.

Los datos fueron recolectados de fuentes confiables.

Se realizaron pruebas de hipótesis para validar los resultados.

Los resultados fueron comparados con los estándares de la industria.

Se utilizaron herramientas de software para el análisis de datos.

Los resultados fueron validados por expertos en el campo.

Gráfico de Líneas de Ejemplo



Gráfico de líneas de ejemplo

Gráfico de Barras de Ejemplo

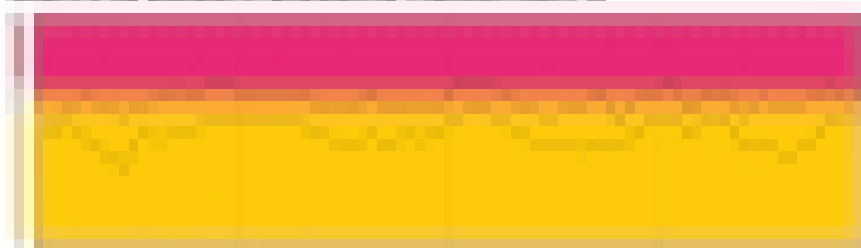


Gráfico de barras de ejemplo



Environmental System Case Study: Environmental



System Overview
 This system is designed to monitor and control the environmental conditions of a large industrial facility. It consists of several key components:

- Environmental Monitoring:** A network of sensors and detectors that collect data on various environmental parameters.
- Data Acquisition:** A system that receives and processes the data from the monitoring sensors.
- Control System:** A central unit that analyzes the data and issues commands to adjust the facility's operations.

The system is designed to be highly reliable and accurate, ensuring that the facility's environmental conditions are always within the required limits.

Components
 The system consists of the following components:
 - **Sensors:** A network of sensors that collect data on various environmental parameters.
 - **Detectors:** A network of detectors that collect data on various environmental parameters.
 - **Control System:** A central unit that analyzes the data and issues commands to adjust the facility's operations.

Figure 1: Environmental System - Monitoring and Control of Environmental Parameters

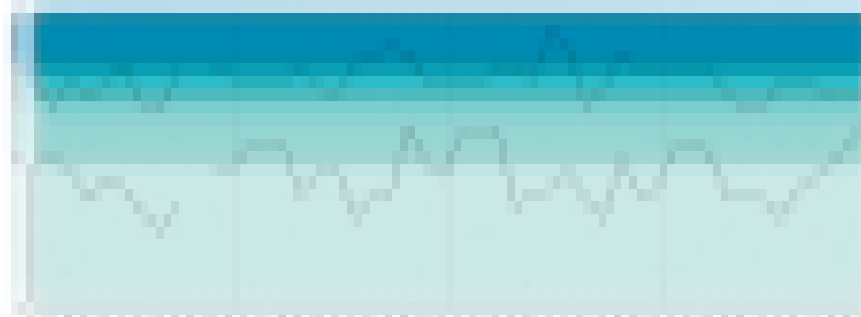


Figure 2: Environmental System - Monitoring and Control of Environmental Parameters





Workflows in action



Workflows in action
 The workflow is a sequence of tasks that are performed in a specific order. It is used to automate repetitive tasks and improve efficiency.

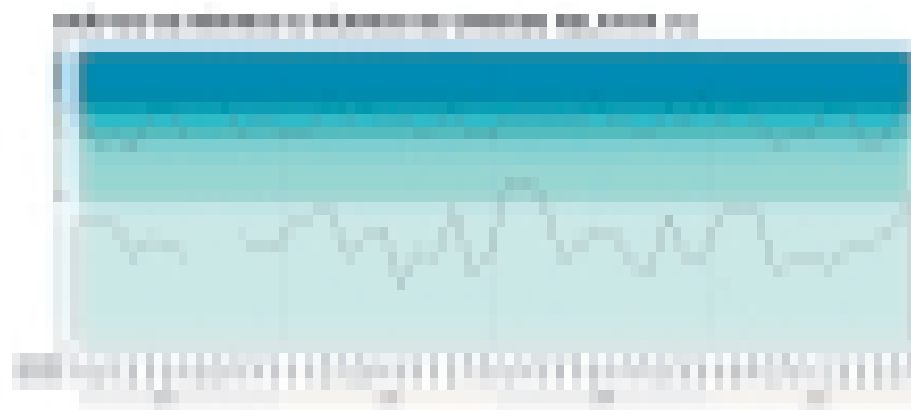
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 The workflow is a sequence of tasks that are performed in a specific order. It is used to automate repetitive tasks and improve efficiency.





more about machine MILLER 6.00 (AMM)



Technical drawing of the machine

DESCRIPTION

The machine is a... (text is blurry and partially illegible)

OPERATING AND MAINTENANCE

... (text is blurry and partially illegible)

OPERATION

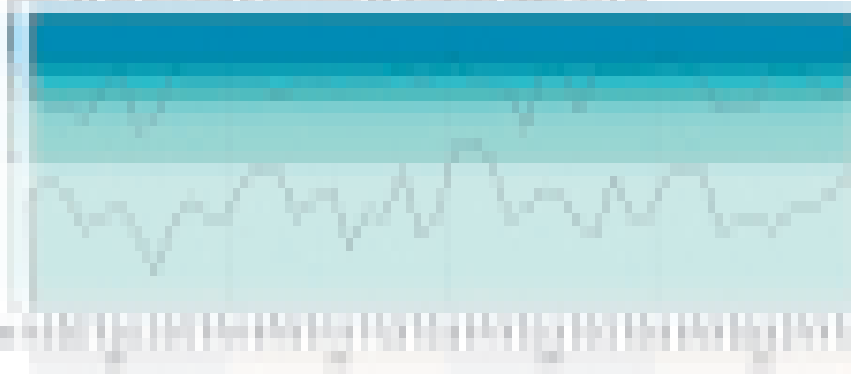
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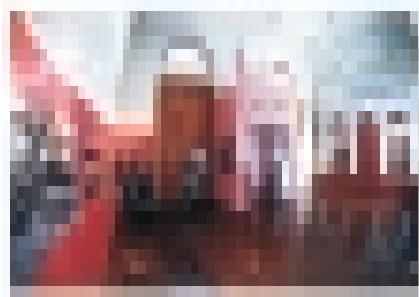
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Graph showing the variation of the temperature of the machine over time



Graph showing the variation of the temperature of the machine over time





How does concrete behave under stress?



Location of maximum compression

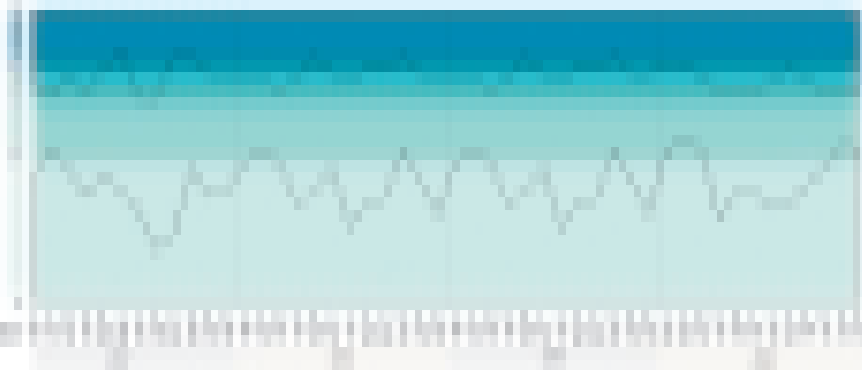
Concrete Behaviour:
 Under stress, concrete exhibits a linear elastic behaviour up to a certain point, after which it undergoes a non-linear strain hardening phase.

Maximum Strain:
 Concrete typically fails at a strain of approximately 0.002 to 0.003.

Example:



Graph of stress vs strain of concrete (linear elastic)



Graph of stress vs strain of concrete (non-linear)





una classe speciale SALVARE I DATI DEI PRONTI



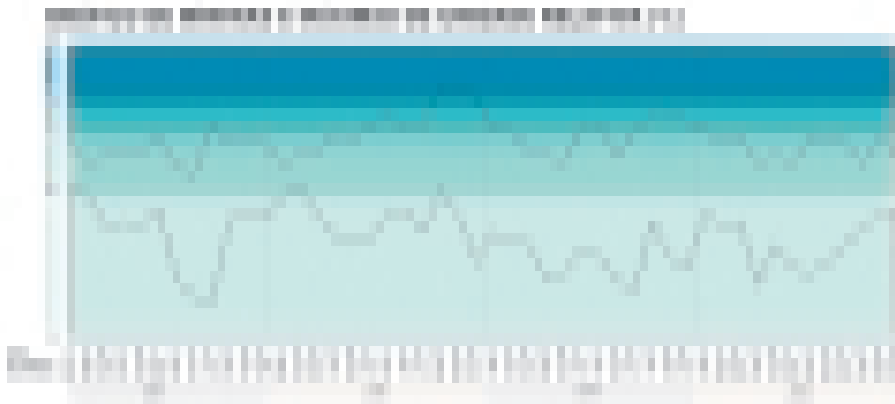
Analisi automatica e filtraggio

Struttura dati:
 lista di oggetti (array di array)

Struttura dati:
 lista di oggetti (array di array)
 ogni elemento è un array
 ogni elemento è un array

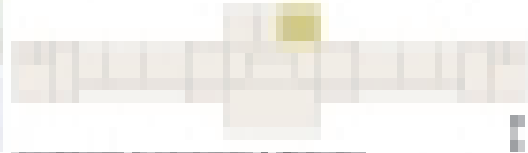
Struttura:

array: [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
array: [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
array: [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
array: [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]





ANALISA DE TEMPERATURA AMBIENTE PLANTA DE 1.º E 2.º ANDARIMOS P. 02.02



ANALISA DE TEMPERATURA AMBIENTE (continua)

Legenda:

0001 - sensor de temperatura de arame
0002 - sensor de arame

ANALISA DE TEMPERATURA AMBIENTE

0001 - sensor de temperatura de arame

0002 - sensor de arame

0003 - sensor de arame

Legenda:

0001 - sensor de temperatura de arame

0002 - sensor de arame

0003 - sensor de arame

0004 - sensor de arame

0005 - sensor de arame

ANALISA DE TEMPERATURA AMBIENTE DE TEMPERATURA AMBIENTE



ANALISA DE TEMPERATURA AMBIENTE DE TEMPERATURA P. 02.02





How do we measure the impact of our work?



Diagram illustrating the measurement of impact.

Impact Statement
 A statement that describes the intended or actual effects of a project or program.

Key Performance Indicators (KPIs)
 Metrics used to evaluate the success of an organization or project.

Examples

Example 1: A project aimed at reducing carbon emissions. KPIs include the amount of CO2 reduced and the number of trees planted.

- Goal:** Reduce carbon emissions by 10%.
- Impact:** Reduced carbon emissions by 10%.
- Outcome:** 100 trees planted.

Diagram illustrating the measurement of impact.

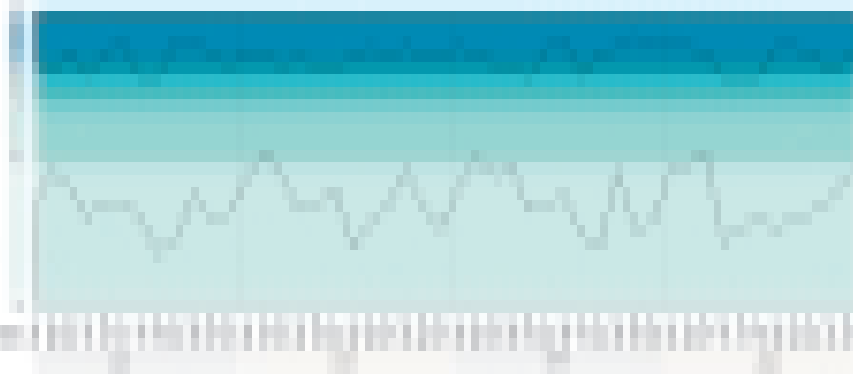
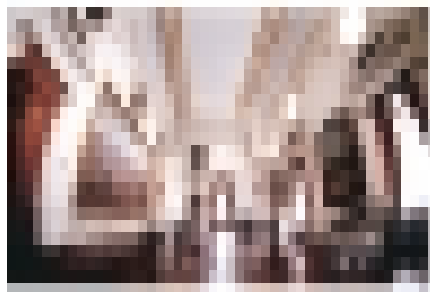
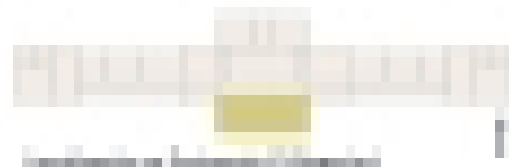


Diagram illustrating the measurement of impact.





more down walking
 100% of 100% 100%



Source: [unclear]
 [unclear] [unclear] [unclear] [unclear]

Summary:
 [unclear] [unclear] [unclear]

Summary:

Number:	1000	1000	1000
Year:	2010	2011	2012
Unit:	1000	1000	1000
Rate:	100%	100%	100%
Value:	1000	1000	1000
Year:	2010	2011	2012
Unit:	1000	1000	1000
Rate:	100%	100%	100%
Value:	1000	1000	1000
Year:	2010	2011	2012
Unit:	1000	1000	1000
Rate:	100%	100%	100%
Value:	1000	1000	1000

Figure 1: [unclear] [unclear] [unclear] [unclear]

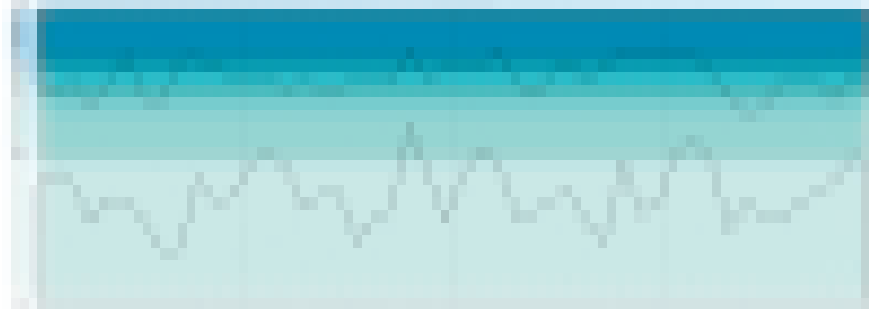
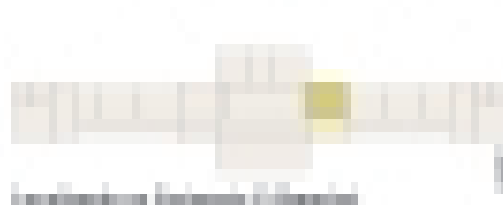


Figure 2: [unclear] [unclear] [unclear] [unclear]





area classe vecchia SALA D'ASSEMBLEA E COLLETTA



Architetto: Roberto Calvesi

DESCRIZIONE

La sala d'assemblea è stata progettata per ospitare circa 100 persone. È dotata di un sistema di illuminazione a LED, di un sistema di ventilazione meccanica controllata (VMC) e di un sistema di riscaldamento a pavimento. La sala è anche dotata di un sistema di audio e video, di un sistema di proiezione e di un sistema di registrazione.

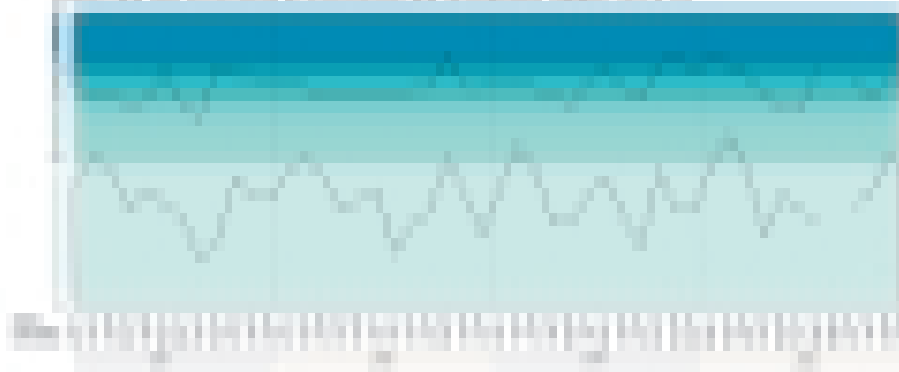
DATI

Superficie: 100 m² | Anni: 2010-2012
 Tipo: Sala d'assemblea
 Stato: Completata
 Località: Via S. Maria, 100 - 00187 Roma (RM)
 Cliente: Università degli Studi di Roma "La Sapienza"

PRODOTTORE

Il prodotto è stato realizzato in collaborazione con il dipartimento di Architettura dell'Università degli Studi di Roma "La Sapienza".

GRUPPO DEI DATI DI MONITORAGGIO TEMPERATURA (°C)



GRUPPO DEI DATI DI MONITORAGGIO TEMPERATURA (°C)





PROVA TÉCNICA DE MATERIAIS

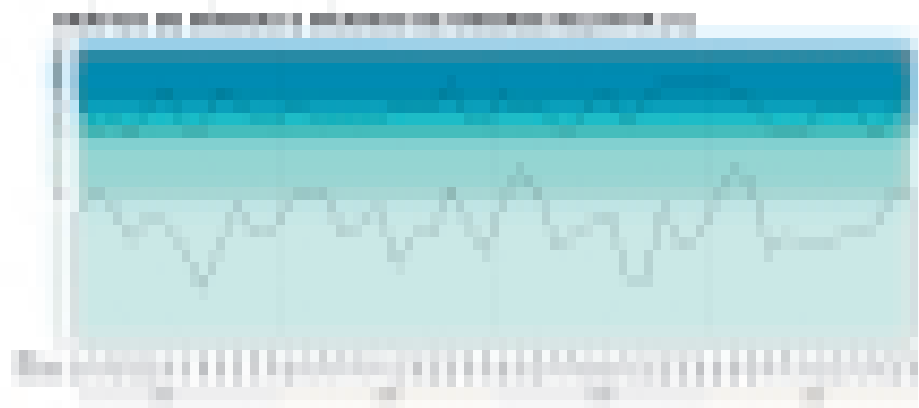


OBJETIVO
 Avaliar a resistência à tração e a ductilidade de um material metálico sob tensão uniaxial.

Introdução
 Este ensaio é realizado em um equipamento de ensaio de tração.

PROCEDIMENTO

1. Preparar o espécime de ensaio de acordo com as normas técnicas.
2. Montar o espécime no equipamento de ensaio de tração.
3. Realizar o ensaio de tração, registrando a carga e o deslocamento.
4. Analisar o gráfico de tensão versus deformação obtido.





CONCEPÇÃO GERAL DO PROJETO



Planta de localização do espaço

Objetivo do Projeto

Este projeto tem como objetivo principal a criação de um espaço de trabalho colaborativo e inovador, capaz de promover a troca de ideias e a produtividade das equipes. O espaço será dividido em áreas de trabalho individuais, áreas de reunião e uma área de relaxamento.

Características Principais

Este projeto apresenta as seguintes características:

Características

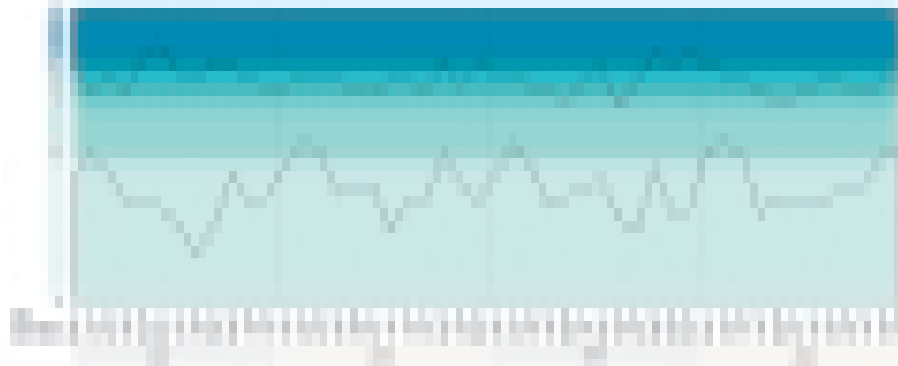
Localização: Rua da Liberdade, 123 - Centro

Área: 150m² de superfície

Orçamento: R\$ 1.500.000,00 (incluindo impostos)

Prazo: 12 meses para conclusão das obras e entrega final do projeto.

ANÁLISE DE TEMPERATURA E UMIDADE DO AMBIENTE INTERIORES (T1)



ANÁLISE DE TEMPERATURA E UMIDADE DO AMBIENTE INTERIORES (T2)





How do we know what we know?



How do we know what we know?

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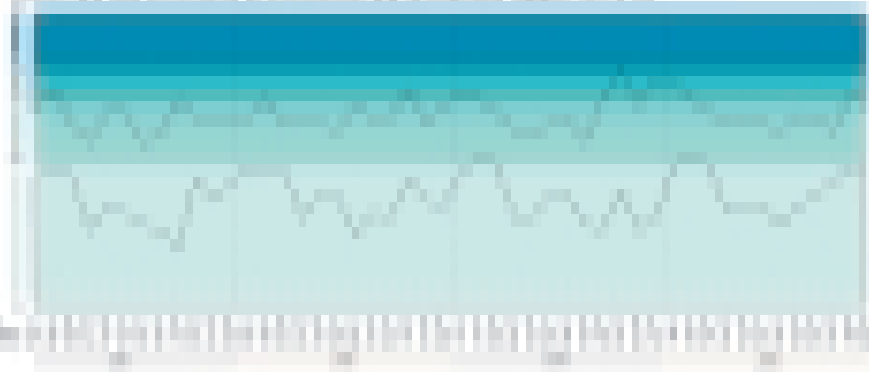
How do we know what we know?
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How do we know what we know?
 How do we know what we know?

How do we know what we know?



How do we know what we know?





Section 1



Section 1

Section 1

Section 1

Section 1

Section 1

Section 1

Section 1

Section 1





PROVA TÉCNICA DE ANÁLISE DA LUZ EM INTERIORES HISTÓRICOS



ANÁLISE DA LUZ EM INTERIORES HISTÓRICOS

OBJETIVO:
Analisar a qualidade da iluminação em interiores históricos, considerando a preservação do patrimônio cultural e a eficiência energética.

Introdução:
A iluminação em interiores históricos é um desafio, pois é necessário equilibrar a preservação do patrimônio cultural com a eficiência energética.

OBJETIVOS

OBJETIVO GERAL: Analisar a qualidade da iluminação em interiores históricos, considerando a preservação do patrimônio cultural e a eficiência energética.

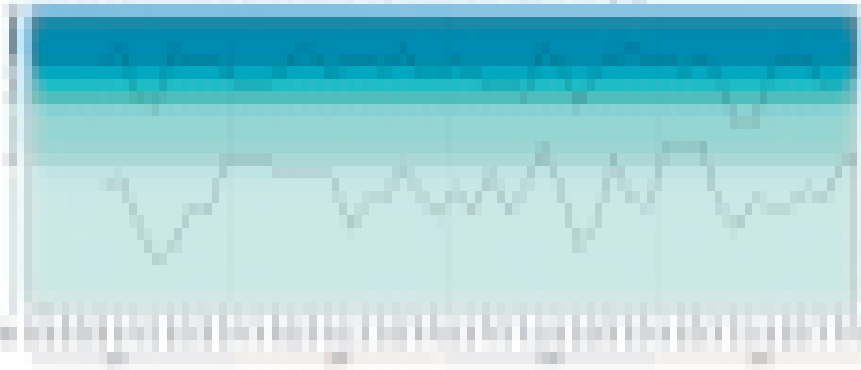
OBJETIVOS ESPECÍFICOS:

1. Medir a intensidade da iluminação em diferentes pontos do interior.

2. Avaliar a qualidade da iluminação, considerando a temperatura de cor e o índice de reprodução de cores.

3. Identificar as fontes de iluminação existentes e avaliar sua eficiência energética.

ANÁLISE DA ILUMINAÇÃO EM INTERIORES HISTÓRICOS



ANÁLISE DA ILUMINAÇÃO EM INTERIORES HISTÓRICOS

