The problem of botanical blindness – a solution for the City Park of Trancoso

Maria Completo[1], Fernando Correia[2] and Paulo Silveira[3]
mariacompleto@ua.pt; fernandojscorreia@ua.pt; psilveira@ua.ptt

[Ilustração / Illustration]

Keywords
Botanical blindness, digital illustration, botanical illustration, environmental awareness.

Abstract

With the advancement of humanity and its subsequent urbanization, a new type of blindness has been developing. Botanical blindness's main symptoms are the unawareness of vegetation life and the lack of ability to recognize and appreciate different plants and their characteristics. The City Park of Trancoso, projected originally as a municipal nursery in 1886 but later considered a botanical park, was considered Public Interest Grove in 2004. Even though it's centenary existence and botanical diversity, this small ex-libris goes unnoticed. To revert the progression of botanical blindness in this region, a new communication tool is being developed utilizing digital illustration. In agreement with the local City Hall, an illustrated guide of the arboreal species in the park is being created, whose main objective is to raise awareness of the general population for the need to preserve and protect this park in a simplified and educational way.

1. Introduction

1.1. Botanical blindness

Botanical blindness or "Plant Blindness"[1] can be defined simply as a lack of understanding and respect for plant diversity and its significance in human existence.

This phenomenon is present when people fail to identify or appreciate the plants around them and their importance for ecological, economic, and cultural reasons [2].

Some authors also refer that botanical blindness can also include the belief that, in some way, plants are inferior to animals making them unworthy of human consideration.[3]

This kind of blindness may affect people regardless of age and/or background and can occur in both urban and rural environments. This phenomenon is rapidly increasing, going hand in hand with the rate of urbanization of humankind.

1, 2 & 3 Universidade de Aveiro, Department of Biology, Universidade de Aveiro, 3810-193 Aveiro, Portugal

CONFIA · 10th International Conference on Illustration & Animation
Caldas da Rainha · Portugal · July 2023 · ISBN: 978-989-54939-9-9

1.2. Causes

Botanical blindness can be caused by a variety of circumstances, including urbanization, loss of traditional knowledge, and an emphasis on animal life rather than plant life.

Evidence suggests that a plant's homogeneous color, grouping, and lack of movement (and a "face") may be important factors in information processing, given that visual perception equals the selection, organization, and interpretation of information.

This is how one of the plants' best survival strategies may also be one of the reasons behind our plant blindness: the ones from similar habitats tend to have common characteristics including (but not limited to) the phenotype.

At a certain distance, they form a green landscape, especially in non-flowering season, where the visual homogeneity is perceived by the human brain as simply, a wall of green.[2][3][4]

Wandersee referred that "Plant blindness is the human default condition" when arguing the nature of the human visual information-processing system.[2]

Other authors refer that some educational biases could also be at fault. It has been proven that elementary school textbooks may be "zoocentric" or "zoo-chauvinistic" - the majority of images, text, and examples used of core biological concepts are all of animals [5][6]. Despite this, not only the textbooks are to blame. Although there is no evidence proving that educators actively omit plant examples in favor of animals, it's possible that they are subconsciously biased [5], leading them to mention them substantially fewer times plants in their classes.

1.3. Consequences

With the rooting of botanical blindness in today's society, preoccupying consequences are emerging given that they have serious and far-reaching effects on both human well-being [7] and environmental sustainability.

One of the most serious consequences of plant blindness is the loss of plant variety. [8] This is a critical factor in the preservation of ecosystem services such as air and water filtration, nitrogen cycling, and climate regulation. When plant variety declines, ecosystems' ability to offer these services is jeopardized, resulting in diminished resistance to climate change, greater vulnerability to pests and diseases, and decreased provision of ecosystem services. It can have serious consequences for human cultures, resulting in diminished food security, and decreased availability of plant-based medications, and other goods that promote human health and well-being.

Another consequence of botanical blindness is the loss of plant-related cultural and aesthetic values. Numerous plant species are culturally and spiritually significant to indigenous tribes, which rely on traditional knowledge and rituals for survival. Plants also add to the aesthetic value of natural environments and give chances for recreational activities like hiking, bird watching, and photography. The loss of plant variety can result in the loss of these cultural and aesthetic qualities, which can have a substantial influence on human cultures' well-being [7].

Plant blindness can potentially have some serious economic consequences due to the reliance of several businesses on plants, including agriculture, forestry, and medicines. Plant variety loss can contribute to lower production in various businesses, as well as increased expenses connected with product development and pest and disease control. This has the potential to have a huge influence on local and global economies, resulting in slower economic development as well as increasing poverty and inequality.

Moreover, botanical blindness can result in a lack of support for plant conservation initiatives, which are critical for conserving plant variety and the ecological services that plants provide [2]. Failure to acknowledge the importance of plant conservation can result in a lack of financing for research and conservation activities, as well as a lack of political will to establish plant conservation legislation and regulations. This can worsen the loss of plant variety and its consequences for human cultures and the environment.

1.4. The role of illustration in science

Art and Science are usually considered opposite poles from the same spectrum, almost as if they are immiscible. A more attentive look at this matter shows us that, in a similar way, both depend on the observation of the world around us. [9]

Scientific illustration, usually defined as "art in service of science" [10], is the artistic way to create visual representations of concepts, phenomenon, and scientific data, generally for the use in scientific publications and educational materials.

Scientific illustrations are effective tools in hypothesis formulation and testing, helping scientists organise their thoughts and graphically investigate the links between different variables and processes by sketching diagrams, flowcharts, or concept maps.

These, in addition to assisting scientific study, also contribute to scientific education and public engagement. Science can be complex and intimidating at times, discouraging many people from actively interacting with scientific information. [11]

Scientific illustrations are effective communication tools because they break down complex information into visually digestible chunks. Visual representations allow scientists and scientific communicators to demystify complex scientific concepts, making them understandable to people of all ages and backgrounds.

1.5. Botanical illustration

Botanical illustration is the art of presenting plants and plant specimens in an aesthetically beautiful and scientifically accurate manner [12]. It has a lengthy history of use, including scientific records, botanical research, and instructional resources.

Botanical illustration's purpose in alleviating botanical blindness is to offer a visual depiction of plant species while also raising awareness and appreciation for their diversity and beauty. [12] Botanical illustrators may assist in overcoming this blindness and raise awareness and

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comprehension of plant variety by generating accurate and comprehensive representations of plants. Botanical images may also be used as instructional aids, assisting people in learning about plant structure, anatomy, and ecology.[13]

1.6 City's Park History

The history of the City Park of Trancoso begins before it's labeled as a park.

In 1886 a municipal nursery was created in Trancoso whose main objective was to grow and take care of plants until they are ready to be transplanted to other locations in the city. This space suffered some changes in the following years, among which its expansion (in size and quantity of plants) and the construction of a wooden hedge around it in 1893, and later a wall and two gates in 1910. In between all these changes, the Municipal Nursery was formally renominated as City Park of Trancoso in 1896.[14][15]

300 years later, on the 5th of February of 1955, in the session of the City Council, it was suggested the afforestation of the Serra do Pisco with the uprooting of the Park's planted trees of an area of 50 hectares in the same year.[15]

In the present year, the park is constituted of approximately 43 different arboreal species from the most varied origins and was considered Public Interest Grove in 2004.

According to the Forests and Nature Conservation Institute, the Public Interest Grove "comprises individual species or arboreal groupings that may be regarded as of important public interest due to their representativeness, rarity, size, age, history, cultural value, or landscape location, and their careful protection is advised".[16]

1.7. Solution for the City Park

My master's thesis topic was suggested by my advisor: look at my homeland and try to grasp what its natural heritage was. Along with him, I then observed a paucity of information concerning Trancoso's municipal park. All Trancoso' residents are familiar with the park and have several stories about activities, walks, and so on, but they are unaware of the species found there or its history.

To reverse the Park's current botanical blindness, we decided to contact the City Council and propose the creation of an illustrated guide to the Park's tree species, not only to bring the population's attention to the need to preserve and conserve the Park but also to create a useful and practical tool for a new type of tourism that has yet to be explored in the region: natural tourism.

2. Methods

For the elaboration of this project, the materials used were the drawing table Wacom Intuos S (2018) and the Adobe Photoshop program.

This project is based on information supplied by the Trancoso' City Hall, which oversees the City Park, where are present 623 tree specimens from 43 different species (22 gymnosperms and 21 angiosperms).

2.1. Digital illustration

The creation of visual art utilizing digital tools and techniques, such as computer software and graphics tablets, is called digital illustration. It entails creating pictures, graphics, and other visual components with specialized tools such as Adobe Illustrator or Photoshop. Advertising, marketing, graphic design, and animation are all common uses for digital illustration.

Digital illustration has several advantages over traditional illustration approaches. It gives artists more freedom and control over the creative process by allowing them to change and edit their work in real-time. It also provides increased precision and accuracy, enabling more elaborate and detailed patterns. Moreover, digital illustration facilitates the sharing and dissemination of artwork since it can be quickly shared and reproduced in digital formats.

2.1.1. Digital illustration applied to botanical illustration

There are several ways where digital illustration is applied to botanical illustration such as:

- Traditional botanical graphics done using techniques such as watercolors or pen and ink can be scanned or photographed, then modified and augmented with computer tools. This enables the digital preservation and sharing of traditional artwork.
- Botanical graphics may be done fully utilizing digital tools and software, such as Adobe Illustrator or CorelDRAW. This gives you more accuracy and control over your illustration, as well as the ability to simply change and edit it.
- Integrating digital components into traditional artwork: To add depth and richness to conventional botanical illustrations, digital materials such as pictures or textures can be used. A photograph of a leaf or flower, for example, can be added to a conventional pen and ink artwork to make it more realistic and detailed.
- Creating layouts and designs for botanical illustrations using digital tools: digital tools may be used to produce layouts and designs for botanical illustrations, such as developing the layout of a botanical field guide or building a digital portfolio of botanical artwork.
- Creating animations or interactive elements: digital illustration techniques may be utilized to generate animated diagrams or interactive plant identification aids for botanical images.

2.2. Methodology

In order to create botanical illustrations, there are many possible methodologies to implement [17]. In the current illustrated guide development, the base of the chosen methodology is described in the following steps; these stages are not required and may vary depending on the species in issue and the material available for reference usage.

1. Selection of plant specimen: For this example, one of the 43 tree species present and identified in the City Park that will be a part of the illustrated guide was chosen: *Tilia tomentosa*, also known as Silver linden.

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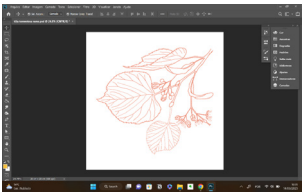
2. Observation: A necessary step where the specimens were observed *in situ* and via photographic material. The main purpose of this step was to note the tree's key features such as its shape, size, color, texture, and other unique characteristics that may help differentiate this tree from others surrounding it.
3. Sketch: A preliminary sketch was created incorporating the details observed previously, such as the arrangement of leaves and flowers, ensuring accurate proportions of all the elements represented.
4. Colour study: Colour is added to the sketch considering the tree's unique colour palette and the volumetry of the elements.
5. Composition and labeling: The illustration' composition was decided and the information that would accompany it (including the proper labeling) was written in an efficient yet simple way.
6. Quality control: The final artwork is validated by a professional illustrator and a botanist to ensure the accuracy and quality of the illustration.



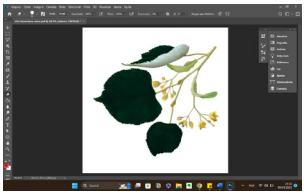


Fig. 1. Picture of the oldest Tilia tomentosa present in Trancoso. Image credits to: https://aldeiashistoricasdeportugal.com/local/tilia/

Fig. 2. Detailed sketch of the Tilia tomentosa' branch where are visible different development stages

Fig. 3. Coloured Tilia tomentosa' branch

3. Conclusion

As civilization continues to grow and urbanize, the phenomenon of botanical blindness has quietly crept up on us. This lack of awareness of the vegetation around us not only impairs our capacity to perceive and enjoy nature's beauty, but also impairs our comprehension of the need of maintaining it. With its vast plant diversity and extensive history, Trancoso City Park is a perfect illustration of how easily we may ignore the natural wonders that surround us.

To tackle this tendency of botanical blindness, a new communication tool based on digital artwork is being created. Its purpose is to increase awareness of the need to conserve and maintain this precious asset by providing an illustrated tour of the arboreal species in the park. This technology not only simplifies and educates the general public about the park, but it also acts as a model for other towns and parks to follow.

The importance of environmental education and preservation has never been greater than it is today. We hope to reverse the march of botanical blindness by establishing innovative solutions, such as the illustrated guide to arboreal species in Trancoso City Park and inspiring a new generation to enjoy and safeguard the natural world around us.

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