The Rooster Wears Code: Parametric Design in Recife's Galo da Madrugada

Each year, as the Brazilian city of Recife readies itself for Carnival, anticipation builds for the grand unveiling of the Galo da Madrugada — a towering sculpture that marks the beginning of the world's largest Carnival parade. In 2025, this colossal rooster stood 32 meters tall, adorned in a striking new costume that brought together centuries-old tradition, collective craftsmanship, and computational design.

While the public marveled at the shimmering colors and intricate patterns covering the rooster's chest, few realized the hidden complexity behind the artwork. The centerpiece of this year's design was a mosaic composed of approximately 10,000 reused plastic bottles, all carefully sewn into place by artisans across Recife. The creation of this monumental jigsaw puzzle was made possible through a Grasshopper script developed by computational designer [Pedro Vilarim](#).

CULTURAL FABRIC, DIGITAL THREAD

At the heart of the design was the image of the *caboclo de lança*, a warrior figure from *Maracatu Rural*, a vibrant Afro-Indigenous tradition rooted in Pernambuco's sugarcane fields. Known for its embroidered cloaks and ritual performances, *Maracatu* became the conceptual source for artist Leopoldo Nóbrega's design. Nóbrega has been responsible for the Galo's costume since 2019, always looking for new ways to celebrate regional heritage through contemporary methods.

Pedro Vilarim's task was to digitize and adapt Nóbrega's artwork into a format that could be reproduced using only recycled materials, — without compromising its visual impact or revealing the design before the official unveiling. This required not just precision, but innovation.
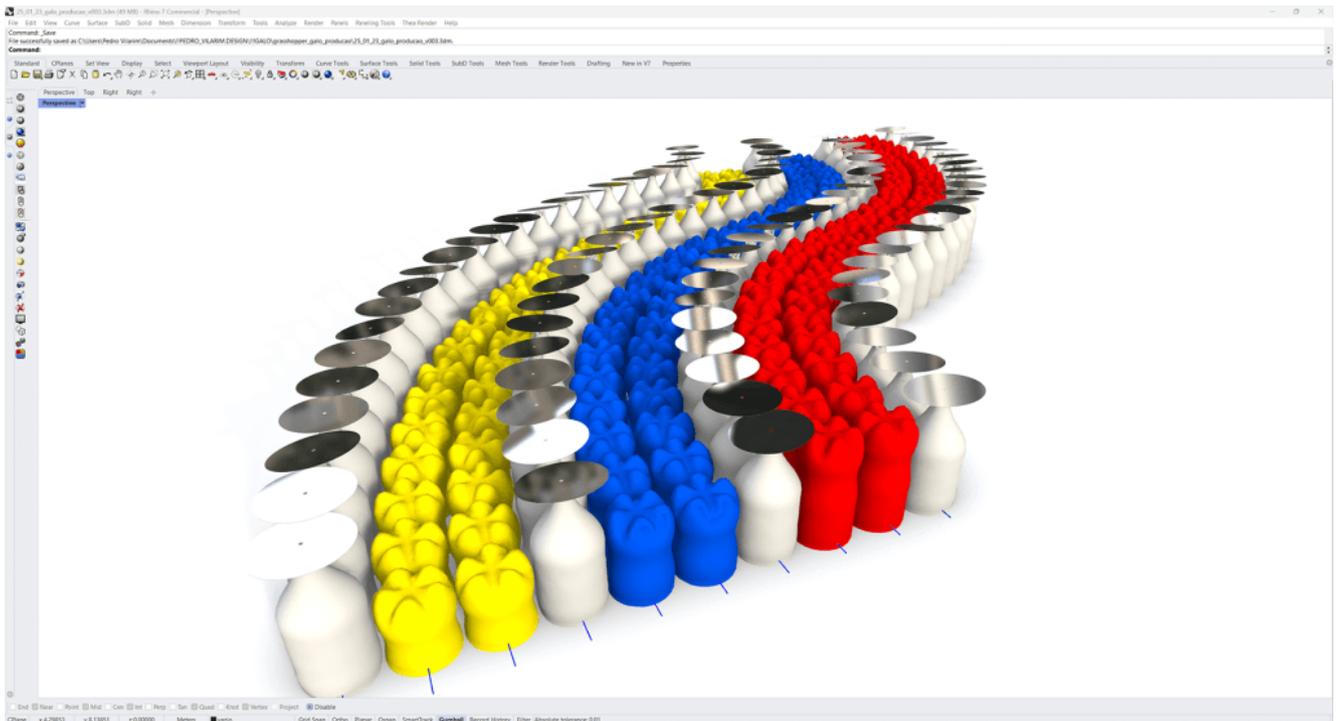

DESIGNING FOR THE HUMAN HAND

Though computational design often serves digital fabrication methods like CNC or 3D printing, this project posed a different challenge: guiding human hands. Dozens of artisans would be responsible for sewing the bottles into position, working from printed templates generated by Vilarim's algorithm.

The process began with the creation of a virtual mannequin of the sculpture using [Meshroom](#) photogrammetry software and drone footage from the previous year's Carnival. This allowed the team to simulate the placement of thousands of PET bottles directly onto the curved surface of the rooster's chest.
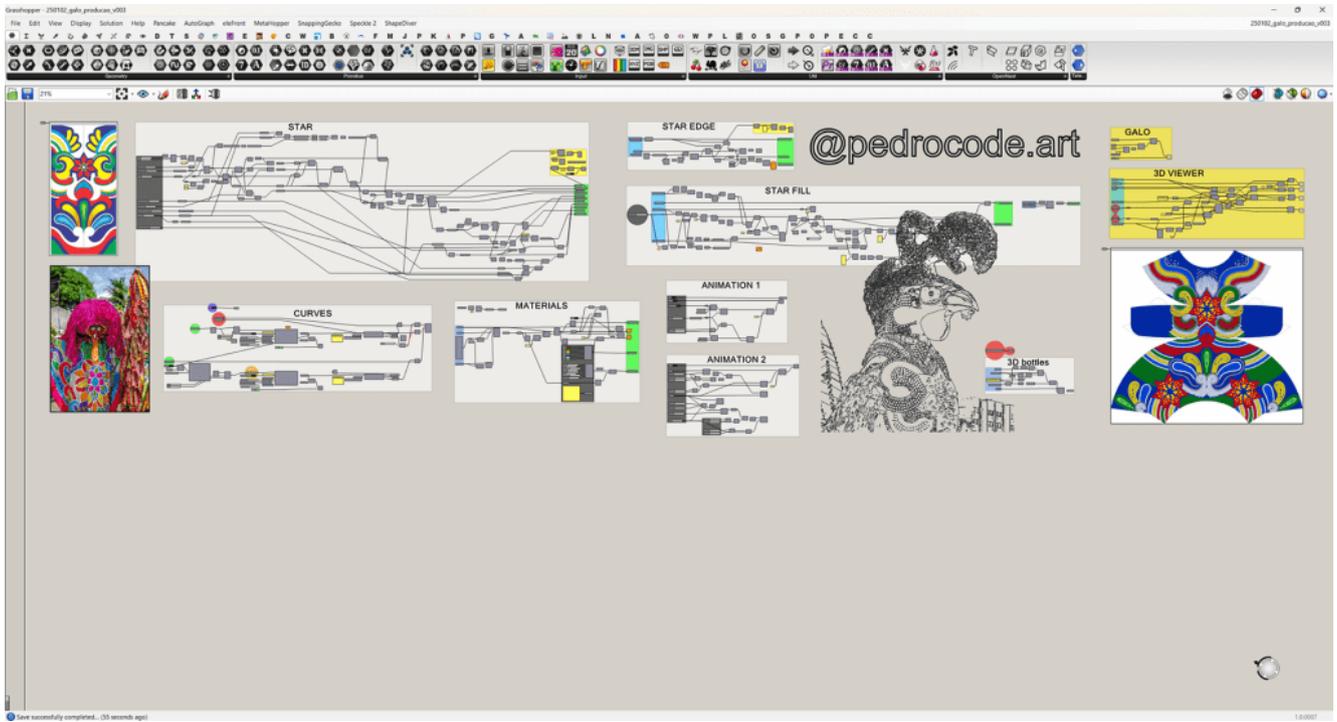
Instead of relying on traditional circle-packing techniques, which failed to capture the expressive embroidery of *Maracatu* cloaks, Vilarim used curve-based logic. His [Grasshopper](#) definition plotted lines reminiscent of stitched sequins, generating offset paths for bottle placement. This approach provided an efficient way to locate over 10,000 unique points on the sculpture's surface — a task that would have been nearly impossible by hand.

To help the artisans, the digital pattern was divided into 10 full-scale printouts, each corresponding to a 25-square-meter panel. These served as maps for color and placement, ensuring consistency and fidelity to the original design.
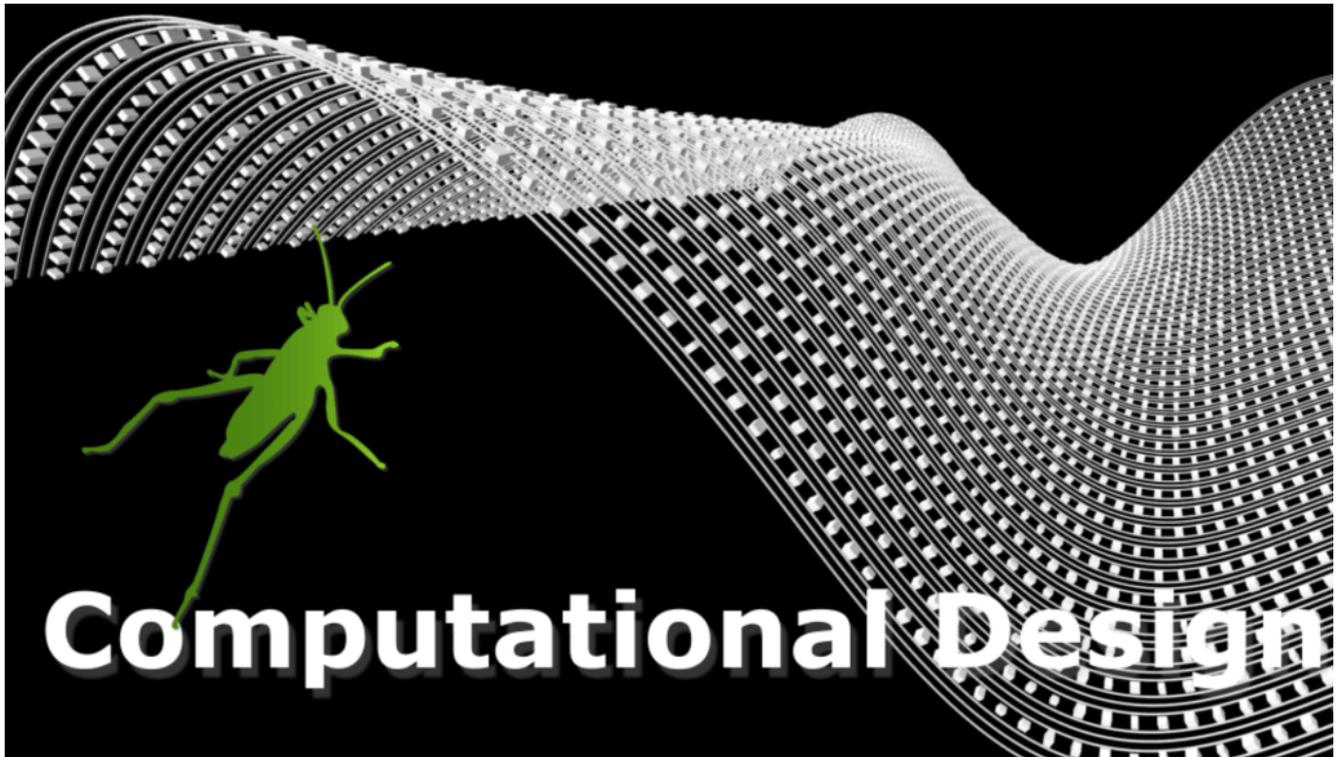
EMBROIDERY BY CODE

Each bottle was sewn onto mesh panels using a method inspired by traditional sequin embroidery. The panels were later fixed onto the sculpture's structure, which also incorporated other reused materials like CDs, PVC tarpaulin, curtain mesh, and even discarded car tires. In total, the sculpture used 20,000 PET bottles and over 95% recycled materials, earning it the nickname "Ecological Citizen Rooster."

The costume was assembled by more than 200 people over 60 days, turning waste into wonder and digital code into tangible beauty. On Carnival Saturday, more than 3 million people gathered around the sculpture as 30 *trios elétricos* and dozens of performers paraded through downtown Recife. The Galo da Madrugada had once again become a symbol of collective joy and cultural pride.

TOOLS BEHIND THE FEATHERS

Pedro Vilarim's Grasshopper script drew on a suite of [Rhino](#) plugins to manage complexity and adapt to evolving constraints. Among them: [Pufferfish](#) for geometric transformations, [Paneling Tools](#) for surface division, [Kangaroo Physics](#) for simulations, and [Squid](#) and [eleFront](#) for visualization and data handling. These tools allowed for rapid prototyping, pattern customization, and the generation of outputs that could directly support artisanal production.

A DIGITAL CARNIVAL

This year's Galo da Madrugada was more than a Carnival icon — it was a case study in how computational tools can support sustainable design, preserve cultural memory, and empower human craftsmanship. Hidden beneath the feathers and bottle caps was a carefully coded choreography that brought Pernambuco's traditions into the digital age, bottle by bottle, line by line.

As Recife danced, the Grasshopper, quiet and unseen, celebrated too, nestled in the chest of a giant rooster under the Carnival sun.

CREDITS

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