The industrialisation of patterns

With the advent of deep learning, over the last fifteen years, images have been massively collected, and organised into datasets, to train artificial intelligence algorithms. Decomposed through chains of mathematical filters, they are treated as visual patterns, to optimise analytical models. But their large-scale analysis led to their effective synthesis: our visual culture, made operational through computer vision, is increasingly permeated by AI-generated images.

Echoing the visual economy at the heart of the digital industry, this workshop invites us to look back at the production, and circulation of patterns in the nineteenth-century textile industry. What could such an archaeology teach us? What nodes of tension – of convergence, and divergence – should be followed, to sharpen a critique of the computational regime we live in?

The AI industry relies, as the textile industry before it, on the systematic *accumulation* of visual materials. The parameters of neural networks are optimised to *recognise* formal properties, among images of the same category; as such, the patterns they detect (and which configure them) are repeated *across* images – and manifest themselves through their organised grouping.[1] In the last five years, a tendency towards

[1] Certain neurons of a neural network trained on photographs of dogs are, for instance, specialised in detecting a dog's nose (a

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exhaustiveness, in the curation of training datasets, enabled neural networks to learn – supposedly – the whole variety of our digitised culture's visual patterns.[2] Beyond specific analytical tasks – such as classification, or object detection –, these learnt patterns could then be used to *guide* the generation of – supposedly – any sort of image. Patterns, as repeated arrangements in image collections, are now used as *models*, or *patrons* (their French etymological root) – ready to be recycled, in AI-generated images.[3]

Patterns were, in the nineteenth-century textile industry, most often understood as designs, *repeating* themselves over a *surface*: the surface of a fabric; their repetition was configured by their techniques of production – rollers, blocks, or looms.[4] But these patterns were also used as *patrons*, sources of inspiration, by design studios – in which they were collected, organised, indexed, archived. As textile samples, or chromolithographs, these – flat – references circulated all over Europe, before being regrouped, in books, on shelves, according to their origin, medium, or novelty. Their practical grouping created, *de facto*, inter-repetitions, or inter-patterns (as opposed to the intra-patterns of the designs themselves) across

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pattern always present in the middle of its face, between its eyes and mouth).
The organisation of datasets can follow a clear, linguistic typology: see the ImageNet hierarchical organisation.

[2] In particular since CLIP, in 2021.

[3] It may be no coincidence that neural networks are also called *models*.

[4] The designer's work is a negotiation, between the *concealment* and the *display* of these repetitions.

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the elements of the collections. In parallel, the classification of patterns in grammars of ornament – according to their period, or place of conception –, favoured their typological apprehension, which impacted both design education, and the theory of art.

Between the two definitions of patterns – as repetitions, and as models – lies, then, the question of their ordering. Whether systematic, or not, labelled, or not, hierarchical, or not, whether as digital files, in datacenters, flat samples, on shelves, or prints, in books, the organisation of visual patterns configures the efficiency of their analysis, and of their reuse, as productive resources.

If patterns are organised to be efficiently recombined, what role is left to humans in their production; what is the status of the workers shaping them? In the 1840s, in Europe, a novel mechanical imagination – influenced by the kaleidoscope, and Babbage's difference engine –, associated with a strong pressure to follow the latest fashion, and with well-developed networks of visual sources, allegedly reduced designers to mere pattern *compilers*. As a commentator of the time noted, they were "mechanical devices that combine[d] drawings", "observ[ing] no principles, follow[ing] no rules, neither hav[ing] any talent or natural predilection".[5] Beyond such discourses, how were textile

[5] Léon de Laborde, *Exposition Universelle de 1851* (Paris: Imprimerie impériale, 1854-1873), 8:402, quoted in Arnaud Maillet, "Kaleidoscopic Imagination", *Grey Room* 48 (Summer 2012): 36-55.

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workers concretely adapting to the constraints of their studio – to the notations, and machines, with which they were composing on a daily basis? The nature of their tasks – between tacit improvisation, and systematic combination – varied greatly over the nineteenth century – depending on target markets, and fabric type. Mediated by technical understanding, invention necessitated time, and material confrontation.

Across the century, new (re)production methods, and scientific developments (such as plastic fibres, and synthetic dyes), transformed the material literacy of both makers, and consumers. Driven by capitalist interests, the constant imitation of one medium by another favoured confusion, instead of material playfulness; trans-mediality became the negation of materiality, rather than its precise comprehension – as it was, for the high-end products of the early century; embodied expertise, experienced from *close up*, with eyes, and fingers, gave way to indeterminacy; as designers transitioned from workers – with technical training – to artists – conceiving patterns independently from any material ground – their output became interchangeable; by leaving the factory, by dissociating themselves from the mechanisms of production – which, in themselves, in their scale and systematicity, had been made ungraspable –, textile designers lost track of the very techniques which were conditioning their work. This detachment from materiality – in its mechanical, but also chemical, physical base –, at the production stage, entailed a general

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ignorance of material properties among consumers; patterns circulated freely between periods, places, and media – not only via their theoretical typologies, in books, or their ordering, in design studios, but also in warehouses, shops, streets, and wardrobes. They were in movement – folded, creased, re-arranged – but their thickness, their depth, was left behind, on the workshop floor.

At a moment when, precisely, neural networks are advertised as being able to generate all types of images – from any medium: photographs, paintings, drawings –, the evident flatness of the computer screen negates this fantasy: this trans-mediality will always be limited by its own materiality, its digital nature. It is by getting closer to the machine, that one might be able to open its functioning, and re-route its economic, and technical *a priori*; the study of the textile industry – its concrete organisations, and formal combinations, its mechanical engagements, and material explorations –, might give us clues, to trace a critique of the AI industry; a critique originating in the manipulation of patterns, and their oscillations – between order, and disorder, between materiality, and mediality, between mechanical determinism, and sensible re-appropriation – unfolding new imaginaries, grounded in history.

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