

at length



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prose



The Revolution will be Personalized

How AI is helping beauty brands look to the future.

By Natalie Toren

Illustration by Sara Wong

If the Consumer Electronics Show that took place in early January is any indication, the beauty industry is hurtling towards a dramatic new vision for our vanities; one so laced with state of the art tech it feels positively *Jetsons*-esque. A mirror that analyzes your skin daily and prescribes a regimen for wrinkles. A hardware unit that brews up custom lipstick colors on demand. A mini inkjet printer that conceals skin blemishes through image detection. While these might be the flashier devices, they echo the clear commitment of the beauty industry to harness the use of Artificial Intelligence.

“What’s popularly referred to as AI nowadays first came out of the advancements in academia in 2011 in computer vision,” explains Lisha Li, a former AI researcher and current CEO and Founder of Rosebud AI. “Due to a combination of novel algorithms and architectures called neural networks, we were able to achieve superhuman results in image recognition.” What followed were applications of AI in language understanding and data-synthesized machine learning.

While the human mind learns in a linear fashion, machine learning is exponential and constantly and automatically improving—so a computer’s capacity for analysis far outweighs human ability. Machine learning is finding applications across industries, but especially in beauty,

where technology has the power to drive product decisions, says Li. Heavyweights like L’Oréal, Proctor & Gamble, Neutrogena, and Coty have, in the last decade, invested tremendous resources and built incubators to attract big thinkers, in a race to revolutionize how we interact with our beauty products and tools. And a crop of successful startups, mostly direct-to-consumer, are shepherding us towards a future where our products will be tailor-made.

Try it on

‘Try on’ technology was one of the first major AI breakthroughs in 2015 to innovate the beauty experience. AI algorithms enabled true-to-life face mapping, fused with the Augmented Reality (AR) of three dimensional shade calibration and texture matching. These apps (originally from Perfect Corps and Modiface but now hosted on major retailers like Sephora) capitalized on the lenses of our smartphones, transforming them into smart mirrors. Users can upload an image of their own face wearing actual product colors available for purchase, or hair colored with a drugstore box dye. Not to mention being able to interact with beauty products with a swipe of the finger, like Cher’s virtual closet in *Clueless*. Increasingly the expectation is that try-on apps will be the industry standard across all online retailers or DTC, functioning to decrease risk (and returns) for the “out of store” experience.

Replacing the Pros

The advancement of AI is now at the stage where it can generate images, videos, audio and other types of structured data. This means algorithms can now create symphonies, paint works of art, and in some cases assume the role of specialized creative professionals. In 2019, *Dazed Beauty* magazine, credited an algorithm called Beauty_GAN as coverstar Kylie Jenner’s makeup artist. A bare-faced Jenner provided the canvas for the program to create original makeup looks generated from the machine-learning of thousands of Instagram beauty images. The result: Jenner was transformed into a drippy, psychedelic vision, her features enhanced by bending dimensions of color. Experimental and exciting, applications like this allow us to experience original content that pushes up against our all-too-human parameters.

Similarly in the perfume world, AI has eased the burden of labor-intensive creative trials. Fragrance house Givaudan’s Carto AI, is built to be an ultra-competent perfumer’s apprentice, while other companies are investing in AI models to be actual perfumers generating formulas. Li’s startup, Rosebud AI, employs AI to create images of unreal—yet freakishly life-like—models with a customizable and diverse range of features, which she sees as a better alternative to traditional stock photography’s predominantly Caucasian libraries. In these, and many more examples of creative responsibilities shifting to machines, the fear is that the role of human creativity and experience will have to evolve.

Big Data Energy

We are a generation raised on ubiquitous quizzes, and now more than ever our self-volunteered answers are being harnessed to build IRL products. Many companies, like Il Makiage and Skylar, have integrated quizzes seamlessly into the discovery process online to sidestep pain points in finding a foundation shade or a personal scent. Prose, which formulates customized hair care for its users, harnesses 85 data points for what it calls “co-creation,” digging down to the effects local tap water may have on your hair by drawing from geolocation data. Curology, Hims, and Hers use webforms to issue telemedicine prescriptions like acne topicals, hair loss treatment, and birth control. The evolution of these algorithms means that all users enhance the experience for each other, creating “products that people want and need and are asking for,” says Priya Rao, *Glossy*’s executive editor and podcast host. “Truly bespoke potions is a real capability, especially in sub-categories with a narrower set of expectations like sustainable, or clean, where people are looking for answers.” Allowing for a single voice to be heard, or a crowdsourced need to emerge, helps to create a new industry standard of prioritizing inclusion above all else. In this way, AI can help reinforce something humanistic, allowing us to be seen for exactly who we are.

New ideas in beauty
mean **radically new**
approaches to the
tech underpinnings.

We sat down
with Nicolas
Mussat, the CTO
of Prose to discuss
personalization,
machine learning,
and why hair pros
still got it.

Q: How did you become Chief Technology Officer at a hair care company?

A: Before Prose, I spent ten years building a successful real estate company in France. I was the first hire, and I went from senior developer to CTO. I was yearning to get out of my comfort zone again when a friend introduced me to [co-founders] Arnaud and Paul who were looking for someone to join them at Prose. The pitch was absolutely enticing to me: a new industry to discover and potentially disrupt. We had a novel distribution model of highly personalized products and an extremely consumer-centric and data-centric mindset. There was an interesting network effect where everyone enhances their own product and in doing so, participates in the greater good. I was hooked pretty quickly. Now I oversee our team of developers and make sure the digital roadmap we've set is delivered on time, with high quality and innovation. We're lucky to have a few sandboxes in which we can play with new technologies, like with the physical orders processing workflow or with computer vision algorithms on which we can build customer-facing features.

Q: Talk to me a bit about personalization and innovation at Prose.

A: We think that personalization must become the new standard, especially when it comes to beauty. We don't believe all the world's diversity can be served with a few dozen formulas stashed on a shelf: it always comes

down to a compromise for the customer and it ends up with landfills of unsold products, which is a pure shame. On-demand personalized hair care means an infinite catalog of products. Likewise no off-the-shelf software can easily cope with this complexity. In practice, this single massive constraint has led us to rethink and redesign almost every part of the experience, from the consultation to our formulation algorithm, the personal hair care routine recommendation and the ability to fine-tune formulas order after order.

Q: How did you make a questionnaire that can point to the real needs of all customers?

A: The questionnaire feeds the Prose Algorithm which results in the creation of formulas. It is built in part with the guidance of the R&D team in Paris (composed of leading hair care specialists), and with machine learning models for clusterization and segmentation. Each question in the webform is weighted to have an impact on your final product formulation. Our approach is not to replace human expertise with machine learning, but to enhance expertise with new insights. This new set of tools allow us to comprehend gigantic datasets the mind can't even apprehend. Knowing the precision with which our formulas are made, the sheer amount of science involved, and looking at our customers' reviews, I know for a fact that some people's needs weren't being served before Prose.