

# A World of Pure Imagineering

From mobile apps to fortune-telling robots, Disney's Imagineers are using digital technology to create unique, but very human, experiences across its theme parks.

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If you ever came face-to-face with Lucky, an eight-foot-tall animatronic dinosaur first spotted in Disney theme parks in 2005, you're unlikely to have forgotten the experience. Lumbering into view with thunderous feet and a friendly bellow, Lucky was able to enact a complex series of interactions with both his human handler and individual audience members. The high-tech gadgetry that made this magic happen was hidden in the flower cart he dragged behind him.

Though now retired, Lucky was the first freestanding character of its kind built by Imagineering – the arm of Disney responsible for creating and maintaining the worlds within its parks. He represented an evolutionary leap from the tentative experiments in animatronics conducted by Uncle Walt himself, which culminated in a flustered Julie Andrews being forced to sing 'A Spoonful of Sugar' with a robotic robin perched on

her fingers, an abundance of wires concealed about her person to keep it tweeting and twitching.

And yet for all the progress made in the half century since *Mary Poppins*, Lucky is a character entirely in keeping with the Disney ethos of employing new technologies to engage one of our oldest instincts: The imagination.

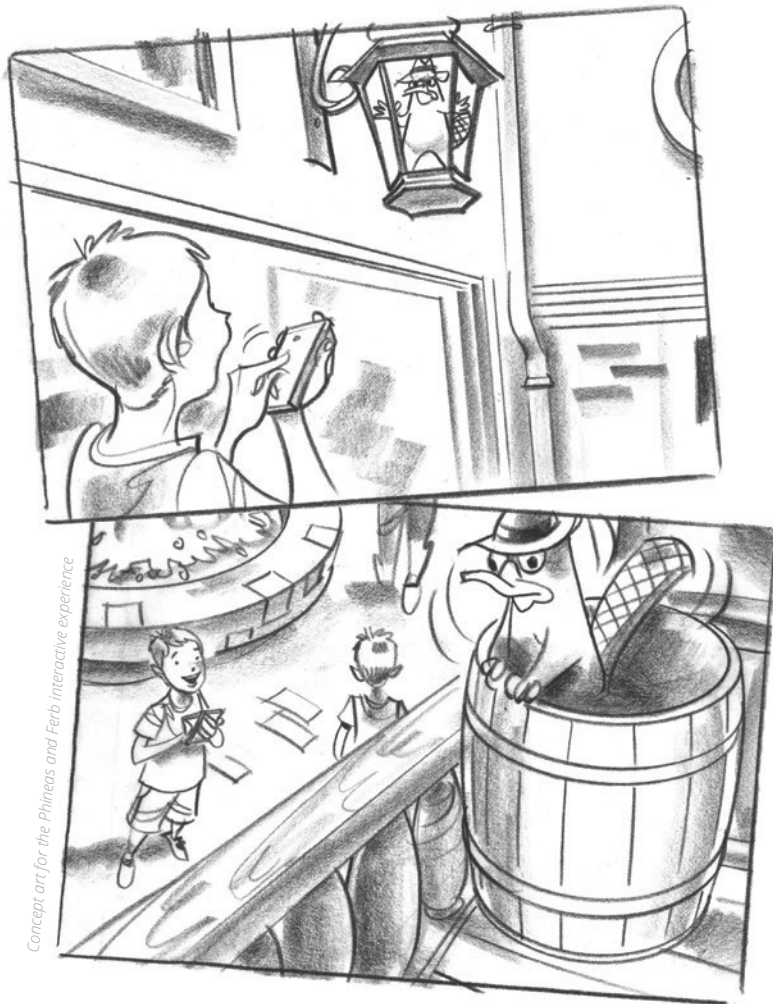
Walt created the Imagineering department in 1952 to oversee the design and construction of Disneyland. Its history of innovations includes the development of Audio-Animatronics (most famously in the Pirates of the Caribbean ride), the FastPass virtual line system, and a total-immersion filmmaking technique known as 'Circle-Vision 360.' Today, it acts as an R&D center of excellence, working across areas including ride systems, special effects, interactive technology, live entertainment, fiber optics, and advanced audio systems.

But it's not just a high-tech hub: Imagineering is Disney's right brain,

the place where technology and creativity combine for a singular, higher purpose – to tell stories. It is these stories that bring Walt Disney's world to life across 11 theme parks, one town, three cruise ships, and dozens of hotels, water parks, shopping malls, and sports complexes.

And yet animatronic characters like Lucky are already considered relics from an earlier age. For Imagineers, the emphasis now is on creating entirely autonomous agents that blend free-roaming robotic bodies with artificial intelligence, giving birth to characters that are able to wander the parks telling stories, answering questions, and generally ingratiating themselves with awe-struck audience members.

It may sound far-fetched, but the first steps have already been taken. Otto, an 'automatronic' robot, was first aired at Disney's annual expo ►



Concept art for the Phineas and Ferb interactive experience

in 2009, where he confounded audiences with his lifelike mannerisms. A year later, an autonomous fortune-telling robot called Destini proved capable of chatting and joking with visitors while reading their futures – all without a human handler in sight.

“The test stage is essential with characters like Otto and Destini,” says Scott Trowbridge, Vice President of Research & Development at Imagineering. “Bringing them out to engage with guests is a way of measuring how convincing they are as personalities, and it helps develop those personalities through engagement with human visitors. We were amazed by the results: With

Destini, we had people peering under the booth, refusing to believe there wasn’t a human somewhere behind the scenes making him act the way he did. It got to the point where we had to show people the computer screens that were actually displaying these characters’ decision-making processes to prove that they really were acting of their own accord.”

But what seems amazing today will look mundane tomorrow. As advances in technology progress exponentially, the Imagineers are having to work harder and faster than ever to keep up.

“That famous Arthur C. Clarke quote about any sufficiently advanced technology being indistinguishable from magic, that’s a mantra we live

by,” says Trowbridge. “Our guests are looking for us to deliver experiences that they can’t find anywhere else, and we use a lot of technology to make that happen. But as the curve of technology and the speed of its advance increases, so do our audience’s expectations, and we have to keep one step ahead of that curve, otherwise it’s no longer magical.

“The benefit is that as those expectations rise and accelerate, so do the opportunities, and we’re unique in the level of advanced research and development that we put specifically into the entertainment space. But the speed with which we implement that research and get the results out there in front of audiences is increasing, and increasing dramatically.”

One of the recent challenges facing Imagineering has been rising to the expectations of a generation raised on immersive computer gaming. For many young people today, a story isn’t unfolding satisfactorily unless they feel individually involved. Disney has long championed the personal experience at its parks: Visitors return again and again to brush up against believable embodiments of characters they’ve known and loved for years. Yet transforming those visitors from mere spectators into characters in their own right is a step the Imagineers are only now finding themselves able to realize.

“We will always be excellent storytellers, and there will always be people who want stories told to them really well,” Trowbridge explains. “But by using new technologies, we also want to give visitors the opportunity to become active participants.”

Sorcerers of the Magic Kingdom at Disneyworld is a case in point. Designed by Jonathan Ackley – whose previous work at LucasArts saw him build innovative roleplay environments in computer games such as

*The Curse of Monkey Island* – the experience begins at the Secret Sorcerers training center on Main Street, where participants are told that a host of Disney villains are threatening to take over the Magic Kingdom. Those brave enough to volunteer their services are given a map of mystic portals and five collectible spell cards before being dispatched on one or more 15-25-minute missions that combine elements of statistical role-play, problem-solving, and treasure-hunting while exploring the park itself.

It's a clear instance of the Imagineers reacting to changed expectations, and an example of how the company's own definition of 'storytelling' has been forced to evolve. Yet the real challenge, says Trowbridge, is creating a system of stories in which no two visitors have the same experience, and in which there are no fixed outcomes: Stories that are written in real time through the actions of the participants themselves.

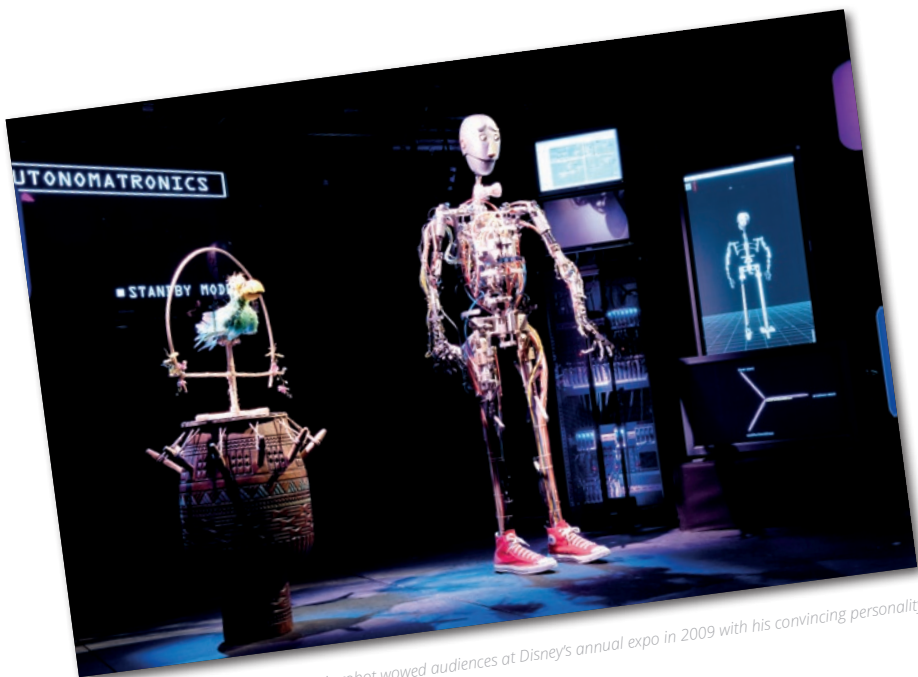
"Our ability to involve guests in more detailed, personalized stories

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has been limited, because there really hasn't been a way to manage and effectively deliver a thousand different stories at the same time. Now, through a combination of new technology and creative innovations, we're starting to offer our guests opportunities to go deeper into the stories, and to play a more active part in the way they unfold, which is interesting, because in doing so we become less didactic storytellers and more story predictors, and we find ourselves authoring story systems rather than individual narratives."

The technology involved remains largely under wraps, but early play tests of an experience called 'Fortuna' offered some idea of what may be in store. Fortuna saw visitors racing around the park in a real-time search for lost pirate gold, following clues and solving riddles as they went. At certain points during the day, characters played by actors became involved – some trying to help guests; others trying to mislead them – and participants began to work together, sharing information and solving problems in groups. What differentiates this from, say, Sorcerers of the Magic Kingdom is that Fortuna was only partially scripted. Aided by story-generating computer software, the plot unfolded based on the decisions that players made as they went.

"Fortuna was an experiment in understanding how we might write a new form of emergent fiction," Trowbridge explains. "What we needed was a computer system to make the next step in anybody's story feel natural and organic, with all the right pacing and dramatic arc to make it seem like it's been expertly authored, even though it's actually emerging in real time. That's not that difficult if you're doing it for one story, but it becomes really interesting – which is code for 'hard' – when you try to make it happen for hundreds of thousands of stories that all interact." ➡



Otto the automatron robot wowed audiences at Disney's annual expo in 2009 with his convincing personality



Concept art and spell card for Sorcerers of the Magic Kingdom



soaking up their surroundings or engaging with family and friends.

By the same token, the company continues to develop cutting-edge animatronic characters to entertain visitors –

from free-roaming creatures like Otto to the audio-animatronic Mr Potato Head bantering with audience members as they queue for Toy Story Midway Mania – but never at the expense of its human cast members, who Trowbridge insists remain at the heart of the Disney experience.

“The world of Disney is all about delivering stories and creating connections – between you and the characters in our world, and between you and your friends or family visiting the parks. There’s no better way to create those connections than through another human being. Our live characters are the most important part of our parks and resorts; they’re the enablers and the core of the guest experience that we deliver. So we’re going to have to get really, really good at our robotics programs before we’re in a position to start replacing our human staff. We’ll probably replace our Imagineers with robots before we replace our cast members.”

And yet for all the futuristic promises of new technology, Trowbridge argues that the psychology of play as a shared experience hasn’t changed very much since Disneyland first opened its gates over half a century ago. To that end, Disney is committed to developing mobile and social networking for use at its parks, but only insofar as they enhance, rather than eclipse, the human aspects of the experience.

The Mobile Magic app allows smartphone users to navigate the parks, track down shows and appearances by their favourite characters, secure places for FASTPASS attractions, and book meals in restaurants. But it stops short of giving visitors an excuse to spend more time staring at a screen instead

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