

SKIN DEEP

如膚之深

Can you weaponize perception, or even consciousness? Snow Crash meets Ex Machina in Isaac Hsu's sci-fi thriller about our precarious grip on reality and the danger of corporate greed in a world in which your own face has a price on it.

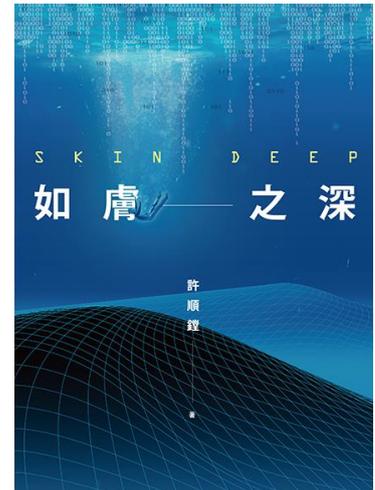
Z-Yee is the only person left in the city still wearing his own skin: bionic implants called “liveskin” have given everyone else with money the opportunity to change their appearance and maximize their beauty. Maybe that’s why Z-Yee has made himself an expert in building artificial intelligences for virtual reality. But things become extremely dangerous once he learns that his very own virtual AI project – with whom he’s falling in love – has been given an assignment still a secret even to him.

Things continue to get worse from there. Z-Yee finds he’s being surveilled – or scouted – while at work, and when he’s made the target in an attack on his company’s premises, he only narrowly escapes with his life. Meanwhile, an upcoming visit by the President himself reveals multiple conspiracies afoot, at least one of which makes use of G-Na, the beautiful AI Z-Yee has constructed who still doesn’t know herself is artificial.

By incorporating the narrative perspectives of both human and artificial intelligence, Isaac Hsu’s fast-paced tale reinvents many of the classic themes of science fiction, like time travel and virtual reality, while also posing penetrating questions about the nature of individual being and feeling. His masterful use of suspense and integration of imaginative technology makes the book a must-read for sci-fi aficionados and general readers alike.

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A graduate of National Taiwan University’s Department of Electrical Engineering, Isaac Hsu is one of Taiwan’s most recognized science



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fiction authors. His lifetime of creative work has garnered numerous awards, including the eighth annual China Times Literature Award (Best Science Fiction Novel); the 1988 Chang Shi-Kuo Science Fiction Prize; and multiple best sci-fi novel prizes at the Keng Hsin Literature Awards. He currently works in the computer industry as a new product and feature planner.

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By Isaac Hsu

Translated by Mike Fu

01

A fine rain began to fall.

Z-Yee's eyes indicated a dry path ahead. The wetness ratio of his clothes was only 1% as he followed the way. A minute later, there was another dry path with a potential wetness ratio of 3%. Once the rain grew more intense, the wetness ratio of any path would likely surpass 30%. This was one of the advantages of living in a densely populated metropolis: the sensory devices of every building wove together a huge network that allowed for precise predictions of short-term microclimates. Though most people didn't care much for the accuracy of dry paths, the few people who wore traditional clothes like Z-Yee certainly noticed. He traveled onward along the dry paths indicated, and consequently was not sprinkled by much rain at all.

In an era when liveskin was all the rage, the three major functions of clothing – temperature conservation, bodily protection, and beauty – seemed all but useless, their effectiveness at an all-time historical low. Men and women wore practically nothing as they went about their business on the streets. Those minimal amounts of fabric had their own functionality, but they served mainly to highlight the physical body. Clothing on a robust and handsome man in liveskin made him seem all the more robust and handsome, while sensual women were even more sensual. The young people of Z-Yee's generation typically dressed for au naturel comfort, baring almost the entirety of their liveskin. But Z-Yee opted to do otherwise.

Liveskin could only beautify a person if they were thin to begin with. For most people, this posed no problem at all. Not that everyone of this generation diligently exercised every day to preserve their figure. Rather, beyond simply covering up bodies to display perfect physiques, liveskin could massage every muscle on command, thus forcibly exercising the body and expending unneeded calories. As a result, most people managed their weight with ease. On top of that, liveskin could manifest a perfect physical body whenever a person wanted. This wasn't limited to a person's limbs, either. The majority of people also kept their faces fully covered in liveskin. Apart from being able to create perfect features, high-end liveskin could also accurately convey a variety of vivid expressions, so that men became all the more broodingly handsome, women ever more graceful and alluring. No wonder Perfect Liveskin Enterprises consistently grossed the highest revenue in the world and possessed a wealth to rival entire nations.

But this was even farther from Z-Yee's reality.

Z-Yee had a perfectly simple reason for not wearing liveskin: it made no difference whether he wore it or not. His large bones made for a very peculiar body, a body that could never

slim down no matter how much he worked out. Though liveskin was supposedly very comfortable to wear, transmitting the sense of touch with incredible accuracy while regulating body temperature, Z-Yee thought his bulky frame would look ridiculous beneath a layer of perfect skin. Thus he decided to wear traditional clothes when he left the house. On rainy days like this one, it was admittedly a headache. Thankfully, the dry path predictor was extremely accurate. By the time he arrived at the research center, he was more or less entirely dry.

The sign that read *Perfect Liveskin Enterprises Research Tower* still shone brightly on a rainy day like this, proclaiming the lofty ambitions of the business. As Z-Yee lowered his head to enter the building, he suddenly felt that he was being watched. Immediately he looked up and discovered that it was the receptionist at the front counter. She was very young and had a pretty little face that looked somewhat familiar. She gave Z-Yee a sweet smile. Z-Yee nodded in greeting at her and hurried into the elevator. The elevator recognized him and automatically transported him to the floor where his office was. On the way up, it occurred to Z-Yee who the receptionist reminded him of: Sister Apple, the host of a super-popular children's show back in the day. All the kids used to adore her. But the receptionist was much too young to be her. The Sister Apple of today was a beautiful older woman who remained active in the entertainment industry.

Come to think of it, when did they change receptionists? He'd never seen her there before. Z-Yee thought back to a rumor he overheard while making tea the other day about someone's pirated facial liveskin. Had they been talking about the receptionist? Liveskin could technically create any kind of face, and most women would make themselves look as pretty as Sister Apple if things were left completely unregulated. If that came to pass, there would be thousands upon thousands of Sister Apple lookalikes on the street, which would make for total chaos, wouldn't it? Liveskin Enterprises had long ago established agreements with governments around the world and acquiesced to the Law of Living Faces, which stated that faces could only be optimized in accordance with their natural shape. Liveskin chips had multiple layers of restrictions to prevent abuse. In spite of this, the streets were still filled with handsome men and beautiful women everywhere you looked. An average face like Z-Yee's actually drew more attention these days.

But that was just how things were on paper. Under the table, the governments of many small countries kept one eye open and the other closed. For one, liveskin wasn't something that everyone could afford, and these governments didn't like to meddle in the playthings of rich people. On top of that, the governments didn't really care one way or another. Even within their own countries, the Law of Living Faces only applied to public places. It was said that some high-end living faces were allowed to change into whatever they wanted in private. At the end of the day, none of these circumstances could be applicable to the woman at the front desk. She was probably just a natural-born beauty who made the people around her green with envy, right?

Z-Yee put these thoughts into the back of his mind as he sat in his spot and put on his mask. Since Liveskin Enterprises created products that conveyed haptic sensations, this was followed by liveskin that could simulate touch and then, as a matter of course, a version that could be used in virtual reality environments. The ironic thing was that although Z-Yee rejected the use of liveskin in the physical world, there was no way he could forsake this same technology in virtual

reality. Once his interface mask identified him by his retina and bone structure, he was automatically logged in. The virtual reality simultaneously adjusted to his personal preferences right in that moment.

A light breeze and a fine mist of rain caressed his face. He felt a kind of inexplicable tenderness for the rain and didn't wipe it off his face immediately. If he wanted to, he could have put on another interskin so his entire body could bask in this spring rain. Humans are strange creatures: when you knew deep down that the rain didn't exist, you could relax and let your whole body get wet. But Z-Yee wasn't going to do this. He came here today just to have a conversation.

He found her in a field of vibrantly bright lavender. Her eyes were gently closed, head tilted up slightly in appreciation of the day's light wind and fine rain. He saw that her delicate features and eyebrows were somewhat tense, as though she harbored unspeakable worries. When she heard him approach, she opened her bright eyes and gazed at him. He felt like the depth of those eyes were staring into the bottom of his soul. For the first time, he also noticed that she looked a bit like Sister Apple. Since they first met, she had grown more beautiful and elegant. But Z-Yee reminded himself that he was responsible for these changes to her appearance. It was only natural that he would find her more likable.

She wore a light gauze today that revealed her beautiful figure in the light rain. If someone were nearby, Z-Yee suddenly thought, would he feel more awkward about the situation, or would she? But any bystanders wouldn't even be able to see the two of them. This scenery and situation had been tailor-made for Z-Yee; only he was allowed to see it after his interface mask had been verified. He wondered if she could even see her own image reflected in his eyes. Perhaps this goddess in the rain before his eyes was merely one of his teenage fantasies.

Deep in contemplation, Z-Yee discovered with a start that G-Na had drawn near and was looking at him worriedly.

"What's wrong?" she asked.

"N-Nothing."

"Did you need something from me?"

"Yes. I heard you submitted a research project application." He made an effort to suppress the resentment in his voice, but he couldn't quite tell how successful he was.

"Yes..." G-Na replied timidly. "I...I'm sorry..."

"Why are you apologizing? Because you didn't discuss it with me first?" Her apology threw Z-Yee off, but he had to steady himself and pretend to keep cool. "Aren't I your mentor? Would I really keep you from the things you want to research? Why did you have to apply behind my back?"

"Well...it's just that..." God! Why did she have to look so adorable when she stammered? So much so that Z-Yee had to remind himself once again that everything in this place was no more than a fantasy he'd given shape to himself. He should have remembered this and just connected with her by voice. Now he had to go ask her himself.

"Or did you decide that you need a new mentor?" Though Z-Yee knew that this was practically impossible, G-Na probably didn't understand this. Maybe she really did want a change? His heart sank, suddenly wondering how much he really mattered to her or what she really saw

when she looked at him. No matter what it was, did he mean anything to her? Why would a man like him, who refused to care about his looks in the real world, start to concern himself in this virtual reality?

"It wasn't my decision," she finally said. "This project was assigned to me by the Director. He also instructed me to keep it a secret until the research topic was decided."

Assigned by the Director? What kind of research would require his level of involvement? G-Na couldn't lie to him, could she? Or did she develop a new behavior pattern? They said from the beginning the special thing about G-Na was her loose control interface; she had a good deal of freedom to develop. As G-Na's mentor, guiding her research and helping her grow had recently become the most important projects for Z-Yee. Up until now, everything had been progressing swimmingly, except for that one little episode. How could there be such a new high-level project that was hidden from him? Was he going to be removed from his role? Z-Yee felt a surge of panic. He put on a calm front nonetheless, as it was better to play the role of the mature mentor. "So the research topic has been decided then?"

"Yes."

"What is it then?"

"The coaching and development of artificial intelligence."

"What?!" Z-Yee shouted. "You know about this?"

"Know about what?" G-Na asked in complete ignorance.

"Oh, I see, it's your research topic." Z-Yee realized with a start that he had nearly committed a grave mistake in offering information that he wasn't supposed to.

"What are you talking about? Of course I know what I'm researching." She rolled her eyes at Z-Yee, an expression that set his heart quickening. Z-Yee made a note to himself to adjust the parameters of this area, or else it would really affect his work.

"Eh?" G-Na had a question for him now. "So you already knew then?"

"About what?"

"My research topic."

When the two of them realized at nearly the same moment that they were having the same conversation again, they both dissolved into fits of laughter. The tense atmosphere of several moments earlier was completely dispelled. After getting the laughter out of their systems, both of them quieted down and things became slightly awkward again. Z-Yee decided to change the subject and asked, "Can you tell me about your research topic in more detail?"

G-Na seemed to breathe a sigh of relief. "It's not that interesting," she said rather shyly. "Two months ago, Mister Director sent a message to say that he had a new research project with ample funding. Now he wanted to open it up for the outstanding personnel in our department to apply...." When she said the word "outstanding", she furtively glanced at Z-Yee and went on to explain, "When I saw 'outstanding personnel' in the message, I knew that this was meant for you."

Z-Yee nearly laughed out loud. He wasn't so thorough. All else aside, G-Na maintained a methodical, almost obsessive research style that was nothing like his own. Z-Yee's expertise was in the transmission of haptic senses through liveskin, but this area of inquiry certainly wasn't

made for an artificial intelligence like G-Na. Z-Yee began to wonder what kind of project would not only come recruit here, but find someone like her suitable?

G-Na went on, “You were out of town at the branch office on the west coast then, so I replied to the Director right away and said that Senior Researcher Z-Yee wasn’t immediately available to confirm whether or not he would apply for this project. I thought this would allow you time to come back and sort things out. The next day, I received a message from the Director asking if I might be interested in working on this project myself. I didn’t have a way to get in touch with you or ask for your opinion. But the idea of independently starting a new project was too tempting. After thinking it over for a few days, I wrote back to the Director and said that I was willing to give it a try...”

“But the Director knew that I was on a work trip on the west coast?” Z-Yee interrupted her.

“Mm, I believe so,” she said quietly.

“I imagine you also knew that the Director knew, right?”

“Mm...” Her voice grew even fainter.

“Which means you didn’t really need to reply to say I wasn’t there, right?”

G-Na’s face suddenly became flushed. “Yes,” she mumbled. “I’m sorry....”

“No need to apologize for this matter. I’m actually happy that you want to conduct research independently. I’m just curious because you didn’t show any real interest the past few times I gave you opportunities for autonomy. Why are you taking the initiative this time?”

“B-Because there were additional terms.”

“What kind of terms?”

“If this project moved ahead, there would be additional funding, which meant the project team could freely select their own research topics. Anyway, I think it’s best if I tell you about the designated topic.”

Z-Yee wanted to ask more questions, but G-Na hurriedly continued, “The project topic is related to the Institute’s newest artificial intelligence, RL Number 1, which has already reached adolescent intelligence in virtual reality. This research project calls for a younger researcher with familiarity in this domain to befriend RL Number 1 and guide the development of its personality and intelligence. The inspection target is for the majority of test subjects to be unable to discern whether it’s a person or artificial intelligence.”

“In other words, the Turing test...” The Turing test was invented by Alan Turing, the father of modern computing and World War II hero who cracked the Germans’ code for the British. In 1950, Turing proposed a test to ascertain whether or not a machine could think. The Turing test isolates the testers from the test subject and allows the testers to ask the subject questions through a device. After this series of questions, if more than 30% of the testers can’t determine whether the subject is human or machine based on the responses, then the machine has passed the test and can be considered a human-level intelligence.

Z-Yee suddenly became dazed as a feeling of unreality set in. This...What the hell was this? Did someone make a mistake? This was exactly the project that Z-Yee was researching himself! Did the Director or his assistant send it to the wrong person? Even if they were trying to weed

him out and start again from scratch, there was no reason for them to choose her! Or could it be that...

G-Na nodded. "Yes," she said. "But, with nonphysical contact as a precondition of the Turing test, it's all too easy with today's technology for AI to simulate humans so that a portion of the testers are unable to determine whether or not they are human. I believe that our subjects already have a very high success rate. Our true goal is what we're calling the Real Environment Turing Test, which involves 'physical' communication in virtual reality, just like how you and I meet and talk. On top of that, not a single failure is allowed. This makes it much more difficult..."

Z-Yee could totally empathize with this point. After all, he'd expended so much effort to train G-Na, his test subject, to the level she was at today. Now it looked like his test subject was being asked to train another artificial intelligence? This had to be a joke or some kind of accident...Z-Yee took a different tack. This was a very creative and ambitious new research method. He had to think it over carefully....

It wouldn't be too hard to create an environment that an AI would recognize as virtual reality to begin with. But glancing over at G-Na's perfect face that looked somewhere between a human and manga character, with her large and shiny eyes, slender eyelashes, and delicate yet high-bridged nose, Z-Yee understood well that these expressions actually only existed in his own cognition. Who knew if this world looked the same to G-Na? And how were they planning to operate an environment that she would presume to be virtual reality? Would it look like the representation of virtual reality that he saw right now? But wouldn't that just look like the real world to G-Na? And what was that she just said? "Our subjects"?

"You just said, 'Our subjects already have a high success rate.' So this project is actually already being carried out?"

Her face reddened again, like a well-ripened apple. "Senior Z-Yee, I'm truly sorry, but the Director said when we got started that the project must be kept top-secret! I completely understand if you want to fire me!" She struggled to maintain her composure while teardrops seemed to swirl at the edges of her eyes, making her look all the more pitiful.... If this was truly the case, Z-Yee thought to himself, the only person who was about to be fired was himself.

"Well," Z-Yee continued carefully. "Could you tell me a bit about how things have been progressing?"

G-Na relaxed visibly when she saw that Z-Yee wasn't about to needle her further. "Now that you know what's going on," she said. "There probably isn't anything I can't tell you, right?"

Z-Yee nodded. If there really were something she couldn't say, he thought, they probably figured out a way to keep her from saying it. Without responding to her question, he nudged her to go on. "What does this artificial intelligence called RL Number 1 look like?"

"I wasn't too sure in the beginning. The first stage of the project was carried out through written communication only, so I didn't know what he looked like. Even though I'd been told that he had the mental development of an adolescent, I saw through our emails and conversations that his intelligence far exceeded that of a normal teenager. Of course I'm not just judging him by the breadth of his knowledge, since AI can easily obtain this from the internet. But the capacity for

judgment isn't something that can be easily copied. Speaking of which, I really should thank you, my Senior Z-Yee." She went on shyly, "When I interact with RL Number 1, I often think back to how you used to guide me. Or I ask myself what you would do in my place."

Z-Yee was startled once more. "But he..." he probed. "He's different from you, isn't he?"

"Aiyo, my senior, of course we're not the same. He's an AI, after all. But sometimes I suspect that he might know he's an AI."

"What makes you say that?"

"Just a feeling I have. He seems to feel out of touch with this world, like he's different from all the rest. Wouldn't it be normal for him to feel this way if he knew he was an AI?"

"But the primary goal for fostering an AI is so that people can't tell if he's human or AI. Is it so important for him to know whether he's an AI or not?" As soon as he said this, Z-Yee recognized that this was a rather dangerous question. Besides, G-Na didn't know that she was an AI herself...

"Mm, it doesn't have much of an impact on the purpose of the experiment. But he will learn more effectively if he believes himself to be a human..."

Wasn't this the reason why we let G-Na believe herself to be human? Z-Yee thought to himself. She was so close to him now, he realized, that he didn't know how to behave properly. Good thing he was only wearing his interface mask and didn't have a sense of touch anywhere besides the face.... He found this thought very amusing. And what if he did have the sense of touch? All of her current behaviors were more or less the product of his own regulations. There shouldn't be anything beyond expected behavior. He was the one with the issue.

It had been Z-Yee's strategy to intentionally magnify G-Na's feminine allure in the hopes that this quality would influence the judges in the final experiment. Perhaps he'd been too successful, as he often found himself under her influence. Just like right now, as she absentmindedly pressed close to him and gently straightened her long hair. Distracted by this action, he'd overlooked some important things: Was there something that she could be hiding from him? That's right! It hit him. "G-Na," he said. "What was the research topic that you were able to freely select under the additional terms of the project?"

G-Na hadn't expected him to ask this and became tongue-tied in her surprise. A few moments later, she suddenly pointed behind Z-Yee and said, "The Manor Administrator is here!" She looked visibly relieved.

Z-Yee turned around and saw that Administrator N-Ni was indeed riding a white horse towards them. N-Ni reined in the horse as she drew near, looking coldly down at Z-Yee and G-Na. Between the two of them, Z-Yee was probably the only one who knew who the Manor Administrators really were. In G-Na's eyes, N-Ni looked after the manor's operations as an Administrator. Z-Yee knew that her actual role in this virtual reality was that of a police officer, dedicated to supervising all the activities that went on here and ensuring that nothing illegal was being carried out. So even though she had cartoonishly beautiful features and, sitting atop her white horse, a voluptuous figure that led one's mind astray, he had absolutely no desire to draw any closer to her.

N-Ni's beautiful visage and frosty expression were not something that Z-Yee had selected. In this virtual reality, a beautiful face cost even less than liveskin in the real world; the system practically gave one to you as a preset. Z-Yee's own face, for example, was that of a typical handsome man. Of course, Z-Yee could have put in some more time and effort so that N-Ni's facial expression was a bit friendlier, but he'd always liked to maintain a respectful distance from the police. He had no motivation to make these changes. Besides, he'd spent all of his processing budget on G-Na in trying to create the most perfect AI. Whenever he saw an AI like N-Ni, though, he couldn't help but wonder what the ultimate meaning of cultivating an AI that looked so human was.

An AI like N-Ni didn't need to make you feel like she was human in order to play her part in virtual reality. Whenever she appeared, it meant that someone was on the verge of violating a rule in this environment, whether obvious or hidden. N-Ni's role as the police, truth be told, would wield more authority and enforce laws more successfully if she were to assume an inhuman form. There was a rumor circulating among Z-Yee's colleagues that the Manor Administrators weren't AI, but actual people. If that were truly the case and there were an anti-Turing test to verify whether a human could successfully mimic an AI, N-Ni would surely pass with flying colors! Z-Yee couldn't help but smile, thinking of this. But then he quickly sank into contemplation of another idea: What was the reason behind N-Ni's sudden appearance at this juncture?

As he thought about this, he turned and said hello to N-Ni and forced a playful smile onto his face to hide his discomfort. N-Ni looked at him coldly without responding. The white horse she was riding rocked back and forth impatiently, unwilling to stand in place.

So she wasn't here to suppress an error? What was she here to prevent, then?

Then he noticed N-Ni was actually focused on G-Na. He suspected there was some nonverbal communication between the two of them, because G-Na gently touched his shoulder and said, "Senior, I should get back to work." She bade him goodbye and strode away quickly.

"Wait!" Z-Yee rushed towards her, but the white horse blocked his path. N-Ni was still atop the horse, looking down at him frostily. She extended her slender fingers and made a negative gesture, slowly shaking her head. When he looked back at G-Na, she was already far away in the distance in front of a black tower. What was really going on here? Z-Yee wondered, perplexed. Could it be that the project G-Na had selected involved classified information? Now that was truly an incredible idea.

02

Z-Yee usually ate lunch by himself. Even if the staff canteen was almost completely full, no one would come sit and eat their lunch next to him. Z-Yee thought that the main reason for this was that he dared to not wear liveskin, even as an employee of an affiliated research unit of Liveskin Enterprises. If his own research projects weren't so successful, he likely would have been kicked out long ago. At any rate, this also allowed him to observe from a distance the commonalities and differences between the various handsome men and beautiful women who wore liveskin.

Sociologists had made plenty of negative predictions about liveskin during the early phases of its technological development, but not all of them had come to bear. For example, one sociologist declared that the cheapening of beautiful faces would lead to an increasingly vulgar society. In actuality, many of the beautiful specimens adorned by liveskin purposely chose to comport themselves with tact and discretion to increase their enigmatic allure; quite a few people also studied diligently so they could cultivate their character. Of course, beauty's role as a source of competitiveness wouldn't disappear entirely with the advent of liveskin. If this had been the case, Liveskin Enterprises wouldn't have become the world's largest company. But because the popularity of liveskin resulted in a society wherein everyone was beautiful, the marginal benefits of beauty had accordingly decreased.

In the past, when females were viewed as property, women were considered morally bankrupt when they actively used their beauty and charms to their advantage. The ironic thing was that when feminism flourished and society became more free and open, women ended up clambering after beauty more vigorously than ever. Regardless of gender, the unspoken reality was that it was socially acceptable to use one's superior looks to one's advantage. To put it bluntly, both situations arose because beauty was a rare commodity. In response, socially inept men turned to 2-D animated characters and porn stars, a rather lackluster counterstrategy. Scholars of later generations believed, of course, that this phenomenon was a spontaneous biological reaction of the human race to demographic pressures, a means to reduce the birth rate and limit population growth. Liveskin technology undoubtedly upended this whole way of life. The technology was not only mature, but cheap and popular; moreover, it could achieve effects that plastic surgery in ancient times could never, ever hope to attain. In this era, with an ordinary income, every single person could become a handsome man or beautiful woman. But to seal victory by means of beauty, on the other hand, was now incredibly difficult indeed.

Society had been accepting of Z-Yee's rebellion because he was younger. But as an employee of Liveskin Enterprises, his situation was rather different now...thus Z-Yee was startled when somebody casually set their plate down in front of him. By the time he made out the face of the person who sat across from him, he was so shocked that he could barely speak. "Y-Y-You..." he stammered. "You don't want to sit here."

"Why not?" asked the receptionist who looked like Sister Apple, smiling sweetly.

"N-Nobody wants to s-sit with me... If somebody sees you, th-things will be bad for you."

"I'll sit wherever I please. I don't care in the slightest what other people have to say."

"B-But I don't even know who you are?"

"It's enough that I know who you are, Little Frenchie."

"W-What?" Z-Yee was so startled he almost knocked over his plate. He held the plate down and looked around furtively. Luckily, no one looked over besides a little girl who was glaring at him. He finally let out a breath, then remembered the name she had just called him. "W-W-Who are you? How d-do you know my—"

"How do I know your name? Ha, I was going to have you guess originally. But since I've given you such a scare, I'll just tell you. Auntie M-Ma asked me to come find you."

“Auntie M-Ma? But who are you? Why would she ask you to come find me? Did something happen to her?”

“Auntie M-Ma is my auntie. What’s there not to get?”

“Huh?”

“She’s my mother’s sister, which means she’s my aunt. Understand now?”

“Ah, are you saying that—”

“Yes, that’s right!” She nonchalantly began to eat the food on her plate. “Wow, this is delicious. You all get to eat such amazing things every day?”

Z-Yee scoffed. “As if you’ve never eaten good food before. This is just regular stuff.”

“Is that so?” She looked a bit awkward, as though she’d been caught doing something wrong. “If that’s the way it is, then you really have to take me to try the good stuff.”

Z-Yee felt a glimmer of recognition as she was talking. Did she sound like her Auntie M-Ma? No, that wasn’t it. Who was it then? Ah - yes. “Did Auntie M-Ma ask you to come to me for something in particular?”

She seemed to be gobbling up her meal quite happily, scraps of it getting all over her face. “Nothing really,” she said as she ate. “She just heard that I started working here, so she asked me to come to say hi to you.”

But how did she know that I work here? Z-Yee had met M-Ma in an anonymous forum. He’d chosen Frenchie as his nickname because it was common for French bulldogs to also have skin problems. Lots of people frequented the forum to absorb new knowledge for their personal refinement, but the reason he went was because it entailed no face-to-face communication whatsoever. This meant that no one would see what he looked like, and thus he could talk freely with others. How was she able to find him then?

“Miss, may I ask how you knew that I work here, too?”

“Auntie M-Ma told me. She said to look for a young guy who’s always dining by himself, and that had to be you. It took me quite a few days of observation to confirm.”

So that was it. He must have complained to M-Ma before that nobody wanted to eat with him. Still, this didn’t explain how M-Ma knew he worked at the east coast branch office of Liveskin Enterprises. Could he have let this slip, too?

“You’re a real oddball, you know. We’ve been talking for so long and you haven’t even asked my name. You even called me ‘Miss!’” Without waiting for a response, she continued, “Just call me Apple. Auntie M-Ma said you wouldn’t want to tell me your real name, so I’m not about to tell you *my* real name. Let’s leave it there.” She was eating all the while and finished her entire lunch rather quickly. Without even wiping her mouth, she shook Z-Yee’s hand, grabbed her dish, and disappeared in a flash, leaving Z-Yee sitting there in a daze.

What was the deal with Apple? And how did M-Ma know so much about him without knowing his real name? Since Apple worked here, wouldn’t it have been easy enough to find out his real name? What was going on today? How did he manage to meet this strange auntie and niece pair? Z-Yee suddenly realized that he was sitting there slack-jawed, while his lunch had grown cold in front of him.

Z-Yee sent a private message to M-Ma on the forum. The conversation with Apple had been so confusing that he decided he needed to ask M-Ma for more information. It wouldn't do to trust everything Apple had said since it was the first time they'd met, anyhow. But there was no response from M-Ma. He took a moment to browse the forum. Both he and M-Ma were following a discussion thread about the essence of time. He went back to look at M-Ma's posts and discovered there were quite a few of them about parallel universes. For example: *If the past, present, and future of this universe all coexist simultaneously, then how do parallel universes relate to this coexistent space-time?*

Z-Yee remembered that he'd replied to this thread himself: *If all moments in time coexisted, why did time flow in one direction only? Why couldn't time flow backwards? Maybe time could actually flow in reverse, but it was beyond the realm of human comprehension?*

M-Ma had gotten to know Z-Yee through this very discussion. Eventually, a renowned physicist answered that time flowed in one direction because of the second law of thermodynamics: the universe tended towards disorder; in other words, its entropy was increasing constantly. Z-Yee probably asked why entropy was necessarily increasing constantly, but there was no way he could have understood the physicist's explanation. Afterward, Z-Yee didn't really keep tabs on this discussion topic. After he and M-Ma started chatting privately, he thought that one of his previous observations had been accurate: the people who were most fervently interested in the backwards flow of time were often those who had lost a loved one. M-Ma's childhood sweetheart had died in an accident. She always fantasized that she might be able to meet him again, if one day there were a scientific means to reverse the flow of time. An orphan like Z-Yee understood deeply this kind of desire. The two of them got to know each other very well because of this.

Still no reply from M-Ma. Z-Yee did a search and found that M-Ma's most recent post to the forum was about an imaginary parallel universe where all the principles of physics had been discovered and could be manipulated or controlled by technology. In this kind of universe, how would one reverse the flow of time? Most people thought that it would depend on which principle of physics they manipulated.

One of the replies hypothesized a parallel universe where the sole principle of physics was that the temperature continuously dropped. The definition of time, then, would be equivalent to a certain temperature. In that case, the reverse flow of time could obviously be achieved by increasing the temperature. But under this law of the universe, a mechanism for increasing the temperature likely didn't exist.

Another reply said that if the temperature of the parallel universe was uneven, then moving to an area of rather high temperatures would cause time to flow backwards.

Fascinating. But, Z-Yee wondered, could this address M-Ma's true concerns? In a world of temperature alone, was there space for memories to exist? Did any organisms exist at all? He shook his head and continued to search.

M-Ma added a few more conditions for this parallel universe. Say this world was constituted by molecules of a single element only, and all objects were composed from this element. Everything was formed by a super cosmic consciousness that could create various objects at will, or turn Object A into Object B, but it could only deal with one object at a time. In this parallel universe, how could the reversal of time be achieved?

Z-Yee thought that he grasped the idea that M-Ma was trying to express, but he couldn't understand what this question meant to her. Or was he overthinking it? Maybe her question came purely from academic interest?

The replies to this were rather uninteresting. Many people believed that if a super cosmic consciousness controlled all, it would naturally be able to control the flow of time. Some had the opposite opinion, though, and challenged whether it would be considered time flowing backwards if elements were rearranged and reconstituted to their state at a certain moment in time. What about human memories, then?

M-Ma's reply: Aren't human memories in the arrangement and constitution of the elements?

Not necessarily, said one reply. Human memories may exist partially in the soul, and thus can't be recovered by arranging elements.

Z-Yee saw that M-Ma asked many more challenging questions on the basis of not knowing what the soul was. As it turned out, no one could really say what the soul was, or how it was related to memory.

This discussion thread was from several weeks ago already.... Eh? Z-Yee realized that it had already gotten quite late. He quickly logged off and left the office.

It was already quite late, indeed. The building was pitch-black save for the areas that lit up temporarily as he walked past. Because of this darkness, the silhouette that emerged beneath the light as he drew closer to the lobby caused him quite a fright. The person was wearing a blue liveskin for work and had an eye mask on. This kind of work liveskin had excellent protective properties and was generally suited for construction sites. It could be worn on its own, but most people used it as a second liveskin unless they had to work in dangerous environments for long periods of time, such as in a mine or in a polar region. In this case, they'd wear a single liveskin. In one glance, Z-Yee's well-trained eye could tell that this was an external liveskin. Modern people found it harder and harder to leave behind their liveskin. It was especially difficult for people to reveal their true skins after they'd aged out of youth, so there was a huge market for second external layers of liveskin. Z-Yee's research on haptic retransmission was well-regarded in this field.

He looked closer and saw that the person was performing maintenance on the escalator. The person waved and pointed at an escalator on the other side, gesturing for him to go over there.

As he passed by, the person suddenly asked, "Getting off work so late?"

"Yes!" he replied unthinkingly, before realizing that this voice was somewhat familiar. When the person removed their eye mask, he saw that it was none other than Apple.