Science + Engineering + Design + Art

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@artbyphysicist Kitty Y. M. Yeung
In Earth year 2020, humans thought that automated machines and their digital replica could relieve them from tedious and repeated labor. Then they could devote themselves in more creative and artistic endeavors. For centuries, they pursued...
World's Population at 8 Billion People

Around November 2022, the world will reach 8 billion people. What is the distribution of this population by region and country?

Source: UN Population Division, 2021

The data presented is an estimate and may not add up perfectly to regional sums.
The $100 Trillion World Economy

GLOBAL GDP 2022

By 2030, China’s GDP is projected to surpass that of the U.S.

The U.S. has been the world’s largest economy since 1871.

China $19.9T
United States $25.3T

Many of the world’s smallest economies are located in the European region, such as Tuvalu with a GDP of $60m million.

Ireland is expected to be the fastest growing economy in the European Union, with a 3.5% increase this year.

Source: IMF (April 2022)
Only to find out that nature has already been doing art so much better without them...
We claim to be changing the world.
But how much of the society have we accepted, adapted and accommodated as is along the way?
Together, we created a world in which no one knows how we came to be.
In my early career doing condensed matter experiments, in order to study the quantum properties of materials, we had to cool things down to sub-Kelvin temperatures, using dilution refrigerators and liquid Helium.

We made the parts for our equipment in the machine shop.
We worked at the nano and the micron scale. Sometimes the experimental "ingredients" were so small, we had to pick them up with eyelashes. No kidding.

We fabricated our samples in the cleanroom.

Hello! How was I helpful?
We sometimes needed to grow our own crystals. And manually wire-bond them onto custom PCBs. Having done so, soldering was a piece of cake.

Crystals were sliced into wafers, which were fabricated into chips based on layout designs.

Chips were mounted onto modules that were put into servers. They formed complex systems.

Back then, quantum computers were still a “dream.”
Understanding quantum computing and Q#

Quantum learning resources
Learn how to develop and apply Quantum computing solutions with documentation, tools, community projects, and Azure services.

Quantum computing foundations
7 for 20 min Learning path - 6 Modules

Welcome to the world of quantum computing!
Whether you’re a developer or simply someone who wants to get a feel for what quantum computing is all about, this learning path is a great place to start exploring quantum computing and optimization.

Imagine you’re the new member of a space crew. The spaceship is equipped with a computer, and you can use the power of quantum to complete different tasks. During your training as a new crew member, you’ll learn about quantum computing optimization and how to use the Microsoft Azure Quantum service.

Welcome aboard!
Physicists are the versatile kind.
TREAT YOUR SOLAR PANELS
LIKE YOUR FAVORITE PLANTS
Art by Physicist x ARMOR ASCA
www.kittyyeung.com
Heart-rate monitoring
Open-Source https://www.hackster.io/kitty-yeung
Imagine yourself wearing a solar-powered overcoat or dress.
This is a collaboration between NovaCentrix

这个是NovaCentrix公司跟我的科技时尚品牌
Donations to STEAM & Environmental Protection

Kickstarter Fees
Payment Fees
Research & Development
Shipping & Packaging

52% Manufacturing
12%
5%
5%
5%

The conflicting nature of productivity

Source: Ellen MacArthur Foundation
Why can’t garment manufacturing be digitized like electronics manufacturing?
One of my projects at Microsoft

A complete ecosystem

Customization; Personalization (AI: ML, CV)
Designer & Consumer Input

Automation; Democratization (AI & IoT: robotics + cloud)
Local & Service

Modularization; Service platform (AI + digitization + cloud)
Fit & Look
Can we make this industry open source?
Industry today:
not sustainable

Circular economy:
(recycling, upcycling, downcycling)
not realistic by itself

On-demand mass customization:
need automated factories,
digital processes,
connected supply chains

inventory = 0, MOQ = 1, SKU = infinity

Era

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Revenue
Business leverage

backed by morality & intellectual curiosity

time, tech readiness

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BESPOKE

MASS PRODUCTION

break down into smaller steps

tunneling

ACTIVATION ENERGY

ON DEMAND

MASS CUSTOMIZATION

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What I learned from academia

Theory | Simulation | Fabrication | Measurement | Publishing
Research

Prototype

Production

Theory | Simulation | Fabrication | Measurement | Publishing

Scaling

What I learned from industry
The fun side? The easy side? The annoying side? The hard side?

What I learned from academia

What I learned from industry
Through noise, we finally found you.
The one that only wants to bring positive light to the world.

Entropy was our enemy.
THE 17 GOALS

In 2015, world leaders agreed to 17 goals for a better world by 2030. These goals have the power to end poverty, fight inequality and stop climate change. Guided by the goals, it is now up to all of us, governments, businesses, civil society and the general public to work together to build a better future for everyone.

1. NO POVERTY
2. ZERO HUNGER
3. GOOD HEALTH AND WELL-BEING
4. QUALITY EDUCATION
5. GENDER EQUALITY
6. CLEAN WATER AND SANITATION

7. AFFORDABLE AND CLEAN ENERGY
8. DECENT WORK AND ECONOMIC GROWTH
9. INDUSTRY, INNOVATION AND INFRASTRUCTURE

10. REDUCED INEQUALITIES

11. SUSTAINABLE CITIES AND COMMUNITIES

12. RESPONSIBLE CONSUMPTION AND PRODUCTION

13. CLIMATE ACTION

14. LIFE BELOW WATER

15. LIFE ON LAND

16. PEACE AND JUSTICE AND STRONG INSTITUTIONS

17. PARTNERSHIPS FOR THE GOALS

HOW CAN I CONTRIBUTE?
The Global Goals will only be met if we work together. See how you can get involved here.

Ikigai
A JAPANESE CONCEPT MEANING “A REASON FOR BEING”

What you LOVE
- Satisfaction, but feeling of uselessness

What you are GOOD AT
- Delight and fulness, but no wealth

What you are PAID FOR
- Comfortable, but feeling of emptiness

What the world NEEDS
- Excitement and complacency, but sense of uncertainty

SOURCE: dreamstime
TORONTO STAR GRAPHIC
This world is full of beautiful things...
Science + Engineering + Design + Art