

Technology Design: Caring For & Learning From Older Adults

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Professor Emeritus, Department of Computer Science

Member, National Academy of Engineering

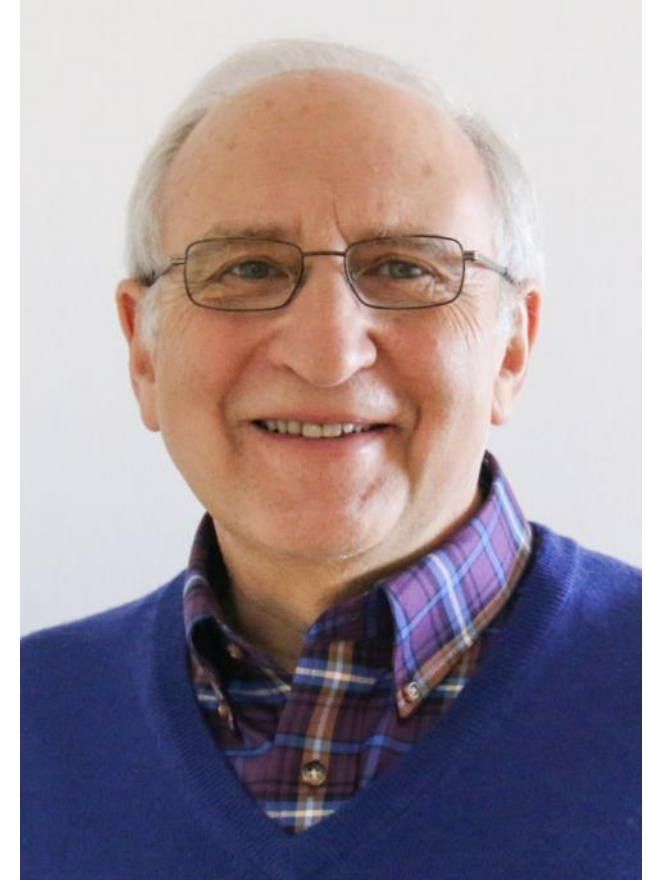


Photo: BK Adams



UNIVERSITY OF
MARYLAND



THE UNIVERSITY
OF BRITISH COLUMBIA

A photograph of a field of yellow daffodils with green leaves, serving as a background for the text. The text 'Human-Computer Interaction' is centered in a white, bold, sans-serif font.

Human-Computer Interaction

A field of yellow daffodils with green leaves. The flowers are in various stages of bloom, and the background is a dense field of similar flowers.

Human-Computer Interaction User Experience Design

Human-Computer Interaction

User Experience Design

Who are the Users?

What are the Tasks?

Human-Computer Interaction

User Experience Design

Who are the Users?

Age range, gender, literacy, experience, disability?

What are the Tasks?

Human-Computer Interaction

User Experience Design

Who are the Users?

Age range, gender, literacy, experience, disability?

What are the Tasks?

Routine, business, create, play, duration, social?

Design Processes

- Study Users Observation, Interview, Survey
- Early Design Prototype, Mockup
- Usability Testing User Feedback, Surveys
- Expert Reviews Red Teaming
- Rollout Process Phased Distribution
- Continuous Improvement Incident Reports, Revisions



Who Are the Users?



Office for the Aging

Older Adults: A growing population with increased and unprecedented longevity: Older adults are living longer and healthier lives, and their numbers are growing.

Highly heterogeneous: There is enormous variation in health, functional ability and financial status. Disparities exist along the dimensions of income, gender, race/ethnicity and education.

Social and economic impact: Older adults hold a disproportionately large share of our country's wealth, represent a enormous source of consumer spending and economic productivity, and contribute in myriad ways (e.g., support to grandchildren, child care) to family and community life.



Office for the Aging

- 72%: overall health to be “excellent or good”
- 82%: overall mental health/emotional wellbeing to be “excellent or good”
- 78%: their community an “excellent or good” place to live
- 38%: getting needed health care was a problem



Supportive Homes & Communities

Cognitive Health & Dementia

Autonomy & Independence

Financial Wellness & Employment

Mobility & Transportation

Staying Connected

Healthcare & Health Service Delivery

Healthy Lifestyles & Wellness

<https://agewell-nce.ca/>



What Are The Tasks?

What Makes Up Good Health?



<https://aging.ny.gov/nysofa-2024-report-unmet-need>

What Makes Up Good Health?



Home Delivered & Congregate Meals
Adult Day Services
Nutrition Counseling & Education
Transportation & Escort Service
Caregiver & Legal Services
Communication & Information Services
In-Home Contact & Support
Personal Emergency Response System
Minor Home Modifications & Repairs
Elder Abuse Intervention & Prevention
Combat Social Isolation & Loneliness
Civic Participation & Employment
Volunteer Opportunities

Human Needs

Mobility

Personal care

Medical care

Medical monitoring

Shopping

Cooking

Finances

Security

Creative projects

(Table 26.1, *Human-Centered AI*, 2022)

Human Needs

Mobility	House cleaning
Personal care	House maintenance
Medical care	Gardening & pet care
Medical monitoring	Mentoring & teaching
Shopping	Contributing & volunteering
Cooking	Information & education
Finances	News, entertainment & games
Security	Wellness & emotional support
Creative projects	Communication & social connection

(Table 26.1, *Human-Centered AI*, 2022)

Older Adults Are a Resource

Caring for Family: Grandchildren, children, ...

Helping Others: Meals on Wheels, visiting, driving, ...

Community Participation: Religious groups, citizen science, ...

Volunteering, Leadership: Advisory Boards, Emeritus Colleges, ...

Philanthropy: Contributions, fundraising, donations, ...

Mentoring & Teaching: Business advice, video courses, ...

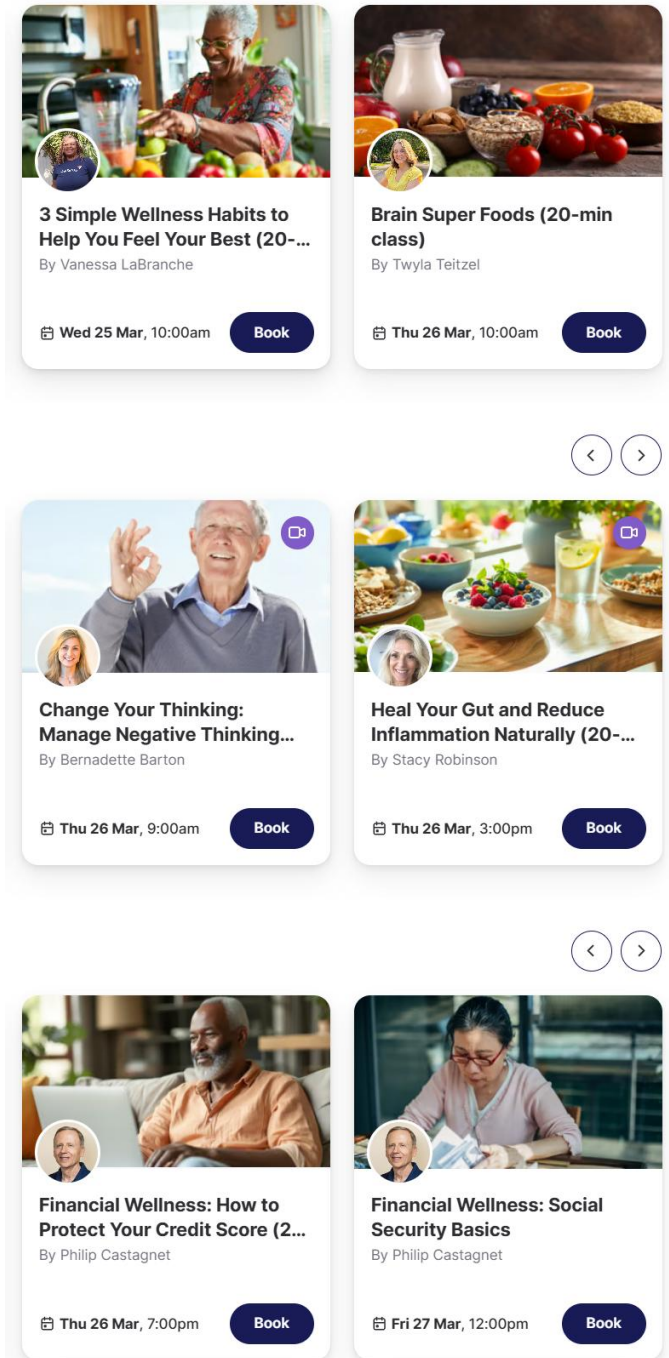
Memoirs & Histories: Books, videos, lectures, exhibits, ...



By offering a wide range of educational and well-being programs, we empower older adults with the knowledge and skills they need to live fulfilling lives.

Our Mission: To create an online platform that celebrates every older adult, offering opportunities for physical, mental, and social growth and enabling participation in communities with a renewed sense of joy, purpose, and fulfillment.

<https://www.getsetup.io/>



Caregivers Need Care



Support & Training for Caregivers
Social Media & Tutorials



U.S. Family Caregivers Act
of 2017 (RAISE)



The Caregiver's
Handbook

A close-up, top-down view of a dense cluster of bright pink azalea flowers. The petals are covered in small, glistening water droplets, giving them a fresh and vibrant appearance. The flowers are packed closely together, with some green leaves visible at the bottom right. The overall color palette is dominated by various shades of pink and magenta.

Human-Centered AI

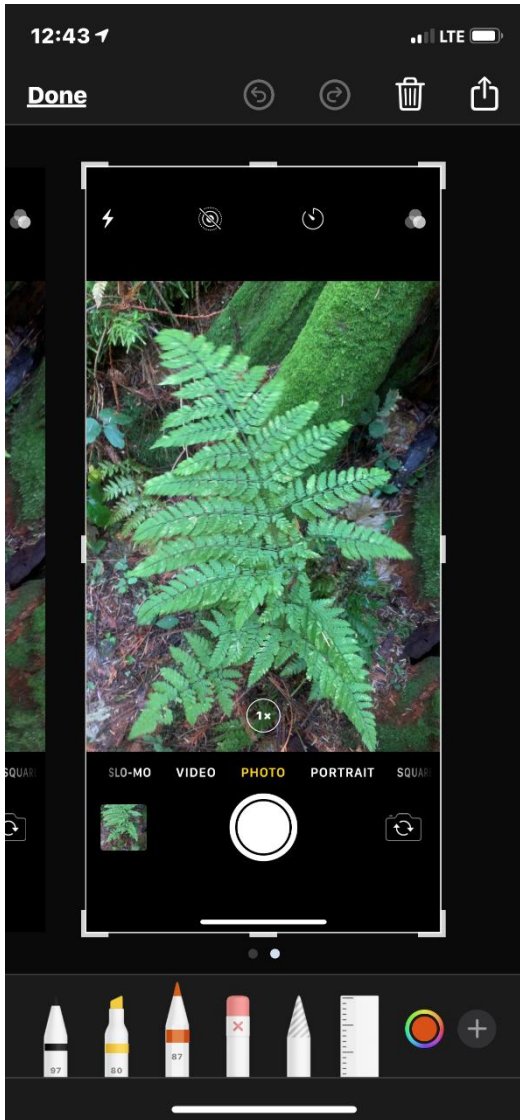


Human-Centered AI

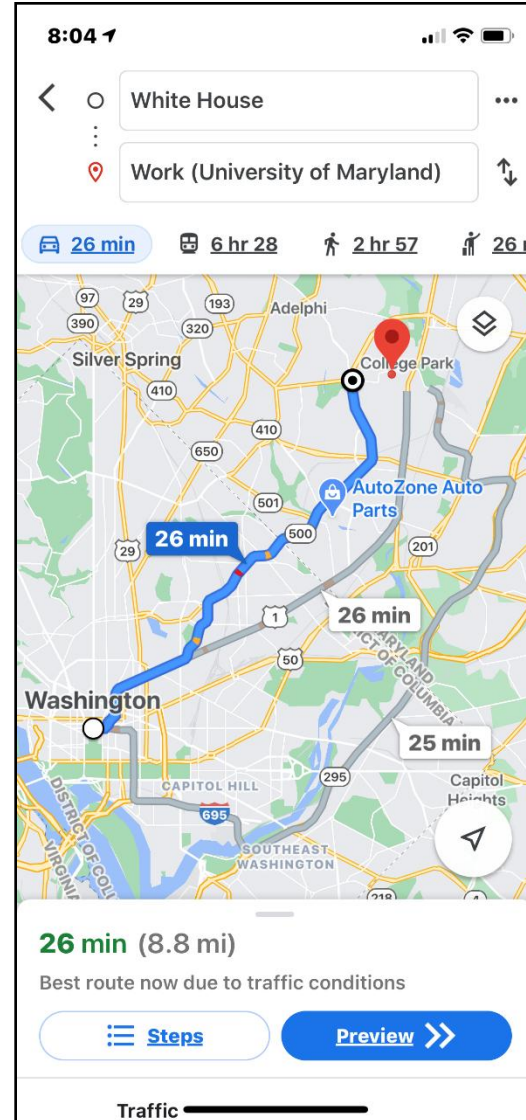
Amplify, Augment, Empower & Enhance

SuperTools

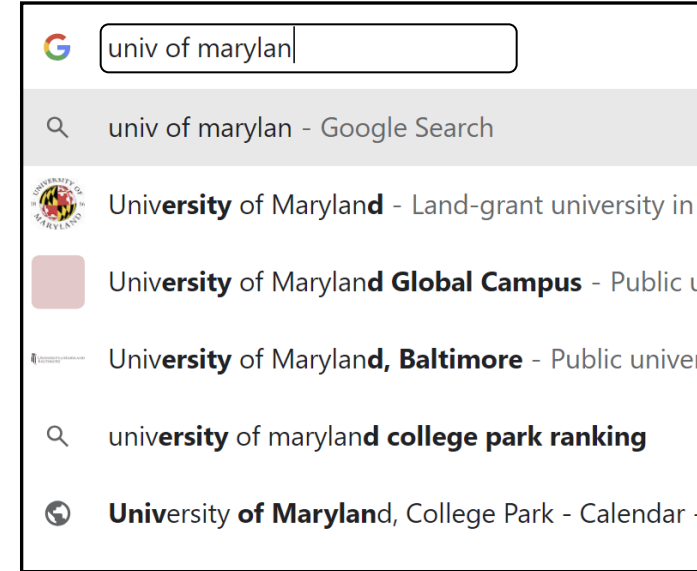
Digital Camera Controls



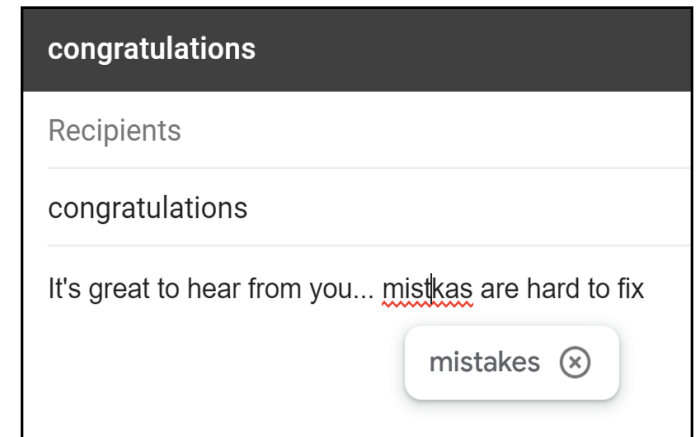
Navigation Choices



Search Query Completion



Spelling correction



Super Tools: Bloomberg Terminal



What is Human-Centered AI?

- Amplify, Augment, Empower & Enhance Human Performance

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- Comprehensible, Predictable & Controllable

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- Self-efficacy, Creativity, Responsibility & Social Connectedness

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- Amplify, Augment, Empower & Enhance Human Performance
- Comprehensible, Predictable & Controllable
- Self-efficacy, Creativity, Responsibility & Social Connectedness
- Human Dignity, Social Justice & Equality



What About Generative AI?

Generative AI



Startlingly Impressive! Alarmingly Flawed!

Powerful Tools, So Learn to Use Them

Gathering Info, Writing, Summaries

Making Images, Video, Music


ChatGPT

+ Ask anything  

Copilot

Hi, how can I assist?




Message Copilot






+ 

Claude

How can I help you?

Type a message...

+  Tools  

 Help me write  Learn about  Analyze image  Summarize text  See More

The New York Times

Why Do A.I. Chatbots Use 'I'?

A.I. chatbots have been designed to behave in a humanlike way.
Some experts think that's a terrible idea.



The New York Times

Why Do A.I. Chatbots Use ‘I’?

A.I. chatbots have been designed to behave in a humanlike way. Some experts think that’s a terrible idea.

“It’s all about what you can do, not what the machine can do,” Shneiderman said. “It’s all about being a tool for you.”

Tech companies, he said, should give us tools, not thought partners, collaborators or teammates — tools that keep us in charge, empower us and enhance us, not tools that try to be us.

25 ChatGPT Styles (Tones)

Professional & Analytical

1. Formal
2. Professional
3. Academic
4. Technical
5. Analytical

Casual & Conversational

6. Casual
7. Friendly
8. Conversational
9. Relaxed
10. Humorous

Concise vs Detailed

11. Concise
12. Straight-to-the-point
13. Detailed
14. Thorough

Creative & Expressive

15. Creative
16. Storytelling
17. Poetic
18. Dramatic
19. Playful

Instructional & Practical

20. Step-by-step
21. Coaching
22. Socratic (asks guiding questions)
23. Teaching/Explainer

Tone & Attitude Variations

24. Empathetic
25. Motivational

What do you want?

Coming of age story about a teenage boy in 1960
Job application for a project manager in social media

+ Ask for Anything

Goal

- Fiction
- Historical
- Journalism
- Resume
- Ad
- Poetry
- Speech
- ▼ [See more](#)

Style

- Academic
- Concise
- Conversational
- Technical
- Humorous
- Motivational
- ▼ [See more](#)

Tone

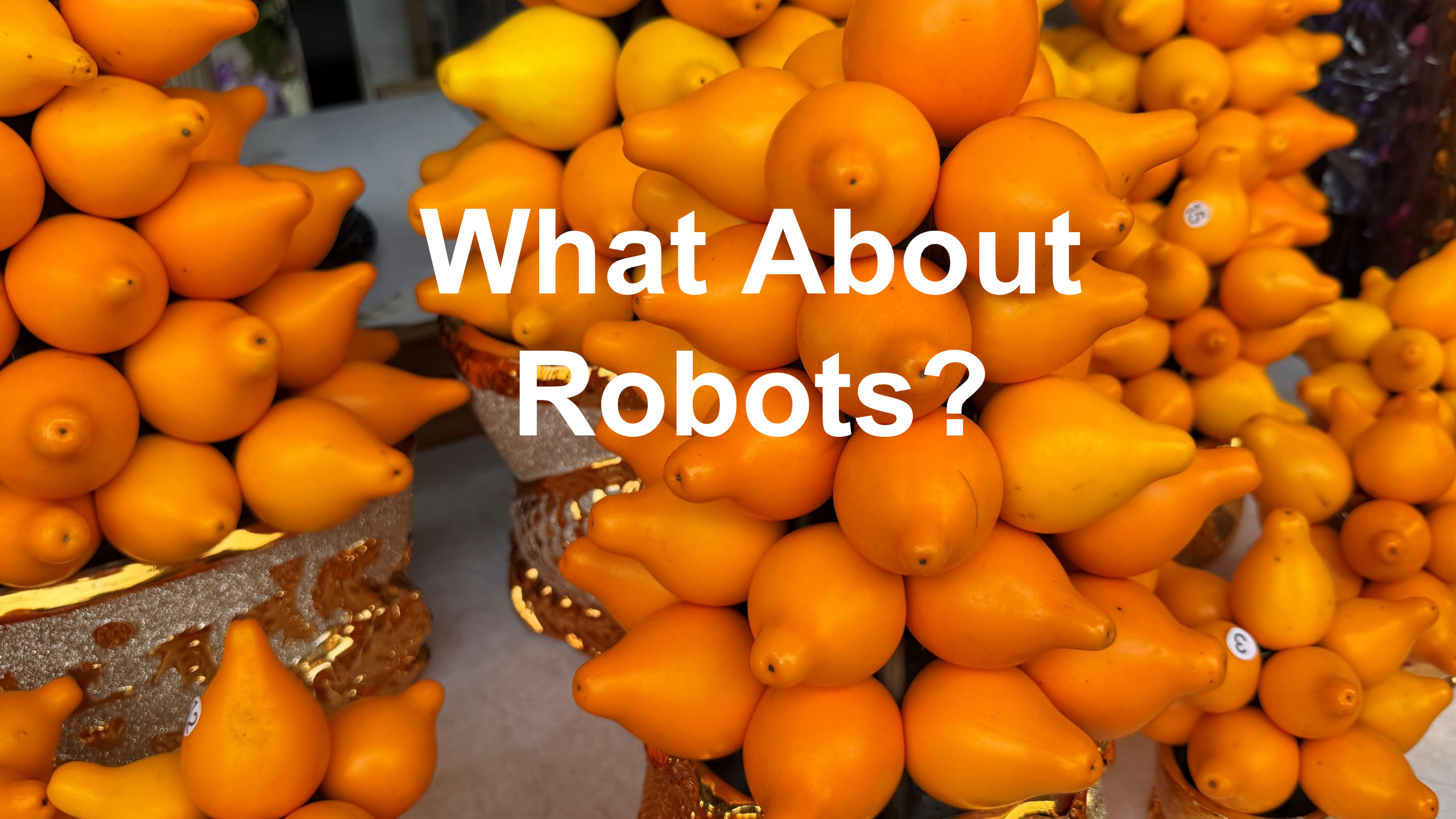
- Authoritative
- Critical
- Optimistic
- Sarcastic
- Mystical
- Empathetic
- Flowery
- ▼ [See more](#)

Format

- Paragraphs
- Bullet list
- Multi-column table
- Limerick
- Sonnet
- Dialog
- Speech
- ▼ [See more](#)

Length: 10 – 1000 words



A large display of yellow lemons in ornate metal baskets. The lemons are piled high, filling most of the frame. The baskets are made of polished metal with intricate designs. The background is slightly blurred, showing more of the display and some greenery.

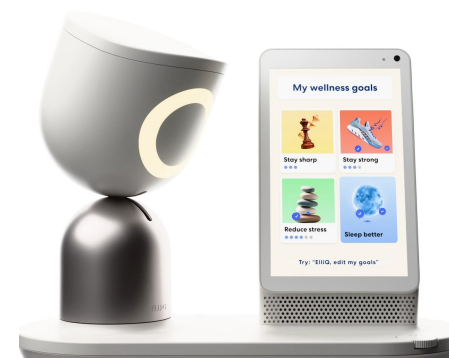
What About Robots?

What Kinds of Robots Are There?

Humanoid



Social, Therapy, Chatbot
Pet, Companion



What Kinds of Robots Are There?

Humanoid

Social, Therapy, Chatbot
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Companion Pet Robots

Low-cost robotic pets are appreciated by many

Often purchased by family members

Novelty is appreciated, triggering satisfying discussions

Joy for All robotic pet dog & cat

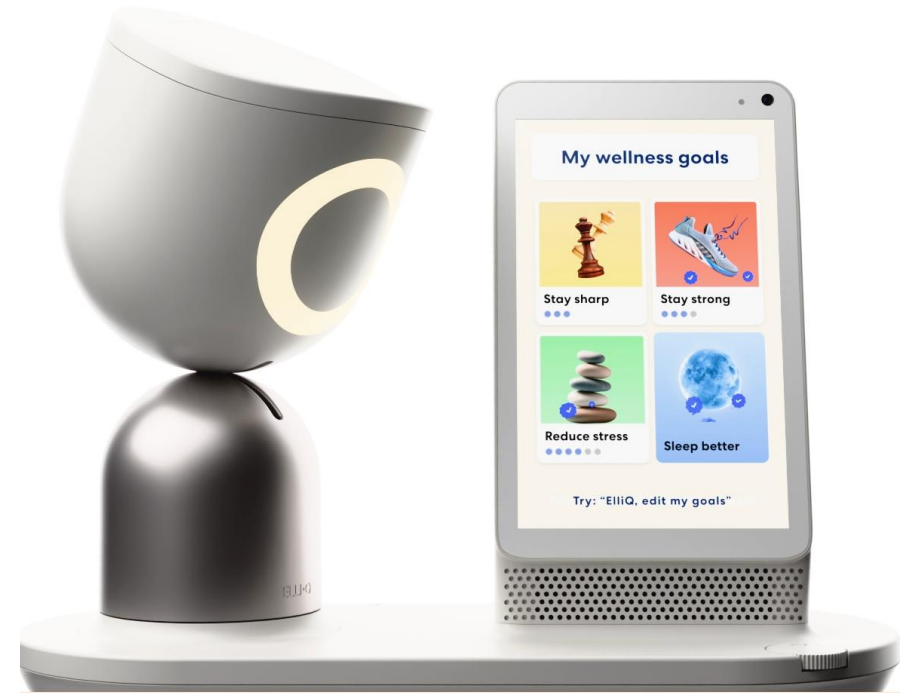


Tombot



Companion Chatbot: ElliQ

Tablet-based chatbot, mounted with movable light source, voice-controlled
Medication reminders, games, communication, education, videos, meditation
“Happier, healthier aging: A friendly robot that makes everyday easier and more enjoyable”



<https://elliq.com/>



Summary

Human Needs

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- Human Dignity, Social Justice & Equality

Generative AI

Startlingly Impressive! Alarmingly Flawed!

Powerful Tools, So Learn to Use Them

Gathering Info, Writing, Summaries

Making Images, Video, Music

But Designs Need Improvements

Pet & Companion Robots

Explore Possibilities – **PROCEED WITH CAUTION**

Avoid Deception

Focus on Human Needs

Amplify, Augment, Empower & Enhance

Three Take Away Messages

Treat Older Adults as a Resource, Not a Burden

Empower Older Adults & Their Caretakers

Adapt Designs for Older Adults

Human-Centered AI

Oxford University Press (2022)

“it is one of the most important AI books in the last few years”
— *Brian Clegg, UK Popular Science*

“excellent introduction...valuable to management who need to both understand how to better direct AI development and to require appropriate AI to solve market and social challenges.”
— *David Teich, Forbes Magazine*

**Category award for Computing & Information Sciences,
Association of American Publishers (February 8, 2023)**

<https://publishers.org/news/association-of-american-publishers-announces-finalists-and-category-winners-for-2023-prose-awards/>



The Future is Human-Centered

Google Group

<https://groups.google.com/g/human-centered-ai>

Website

<https://hcai.site>

Univ of Maryland website

<https://hci1.umd.edu/human-centered-ai/>

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