

Vision-Driven Design

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Figure 1: Lifespan of Technologies, Needs, and Vision

Abstract

Visions have always driven my design. In this talk, I trace the evolution of my design visions over the past three decades—from **Tangible Bits** to **Radical Atoms**—since joining the MIT Media Lab in 1995. I then introduce my latest, and perhaps final, vision: **TeleAbsence**, which moves beyond Telepresence.

CCS Concepts

• **Human-centered computing** → **Interaction paradigms**.

Keywords

Vision, Paradigm, Design, Tangible Bits, Radical Atoms, Telepresence, TeleAbsence

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1 Introduction

Looking back at the history of Human-Computer Interaction (HCI), we observe that major breakthroughs have rarely resulted from studies focused solely on users' needs or task performance. Rather,

they have often emerged from the passion and dreams of visionaries such as Dr. Douglas Engelbart [1]. By looking beyond current limitations, we believe that vision-driven design plays a critical role in fostering such breakthroughs, complementing both needs-driven and technology-driven approaches.

Among the three approaches to design research—technology-driven, needs-driven, and vision-driven—we emphasize the vision-driven approach for its longevity. Technologies often become obsolete within a few years, and users' needs evolve rapidly over time. In contrast, a clear and compelling vision can endure far beyond an individual's lifespan.

Visions have always driven my design. In this talk, I trace the evolution of my work over the past three decades—from Tangible Bits [9] to Radical Atoms [8]—in pursuit of realizing the dream to “make bits tangible and atoms dance.” Since joining the MIT Media Lab in 1995, this vision has guided my research trajectory (Fig. 2, Fig. 3). I then introduce my latest, and perhaps final, vision: TeleAbsence [4], which moves beyond Telepresence [6] to explore the “presence of absence” as a new design opportunity (Fig. 4).

Tangible Bits and Radical Atoms aim to create seamless interfaces between humans, digital information, and the physical environment by giving dynamic physical form to computation. Tangible Bits make digital information directly manipulable and perceptible[2, 3], while Radical Atoms envision a future in which physical materials themselves “dance,” changing shape and properties computationally[8].

My journey began at NTT Human Interface Laboratories in the early 1990s, where I explored seamless telepresence media such as TeamWorkStation[5] and ClearBoard[6, 7]. At the MIT Media Lab, this vision evolved into Tangible Telepresence[10], eventually merging with the Radical Atoms[8] vision.



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Now, in the concluding chapter of this exploration, TeleAbsence[4] envisions illusory communication media that embody the presence of absence—inviting reflection on how technology mediates not only connection, but also separation, memory, and loneliness. Visions allow us to reimagine the relationships between bits and atoms, presence and absence, opening new possibilities for interaction design.

Dr. Alan Kay’s “Visions, not goals” principle:

My dear mentor, Dr. Alan Kay, once reminded me: *“When inventing the future, the importance of a bold, romantic vision cannot be overstated.”*[11]

I conclude by sharing three guiding principles that have shaped my vision-driven design research:

- (1) Be Artistic & Analytic
- (2) Be Poetic & Pragmatic
- (3) Be Romantic & Realistic

I close with this message:

- Life has an endpoint, but the future is never-ending.
- Technology soon becomes obsolete, but true vision is everlasting.
- What legacy will you leave for those living in 2200? How do you want to be remembered?

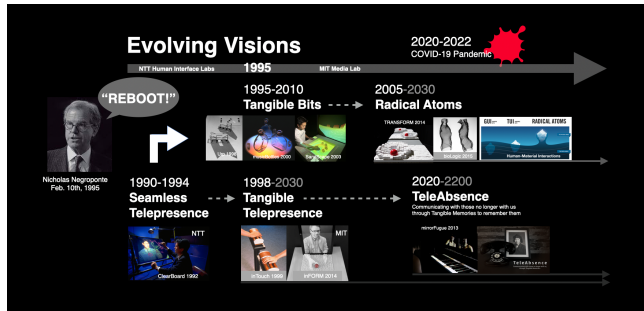


Figure 2: Evolving Visions.

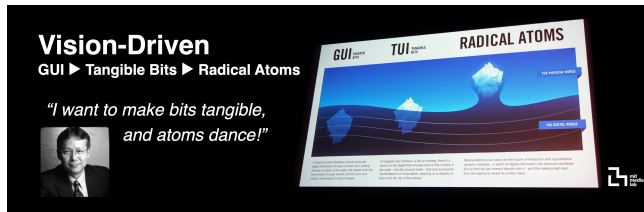


Figure 3: Evolving Visions: From GUI to Tangible Bits to Radical Atoms.

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Figure 4: Evolving Visions: From Telepresence to TeleAbsence, From Remote Space to Remote Time.

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