The Marvin Minsky Music Project

The theoretical and engineering works of Marvin Minsky -- who is often called "the Father of Artificial Intelligence" -- are widely known and cited. However, the role that music plays in his life and research is a richly revealing and popularly-accessible "hook" for the general public that has been largely neglected.

As part of a comprehensive anthology of Marvin Minsky's works, ideas, and stories, we are using an exploration of his life with music as a major organizing thread.

The two works that we envision are:

   * Musings: An interactive revision of Minsky's 1981 paper – "Music, Mind, and Meaning" – that sits atop a substantial multimedia database: video clips, audio, texts and pictures of Marvin's musical improvisations, compositions, discussions with other musicians about ideas, relationships with music, gossip and shop talk about music.

   * A stand-alone documentary film about Minsky's prodigious musical invention and its role in his life and thinking.

To create these works, we are drawing from a rich historical collection of multimedia materials and a core of new materials produced by us.

The main narrative thread will be provided by a series of video-recorded encounters between Minsky and Prof. Teresa Marrin Nakra, a close friend and former student. Together, they will visit a number of venues that have significance in Minsky's life, discussing the reminiscences that these places produce. They will also have sessions at a piano, where Minsky will alternate between musical improvisations at the keyboard and discussions of musical examples by others, themes in his paper, and stories from his life.

To complement that material, we will produce recordings of discussions/music sessions of Minsky together with leading musicians, composers, technologists and entertainers of the 20th and 21st century.

We anticipate that this project will take 40 weeks to complete, at a cost of $220,000.
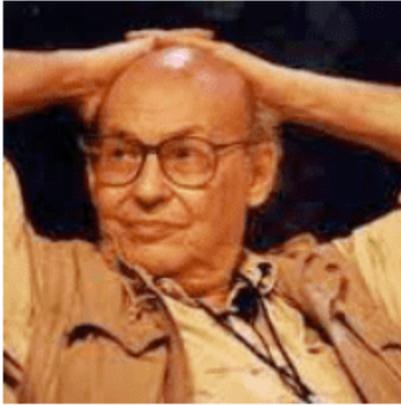
Marvin Minsky on Music and Thought
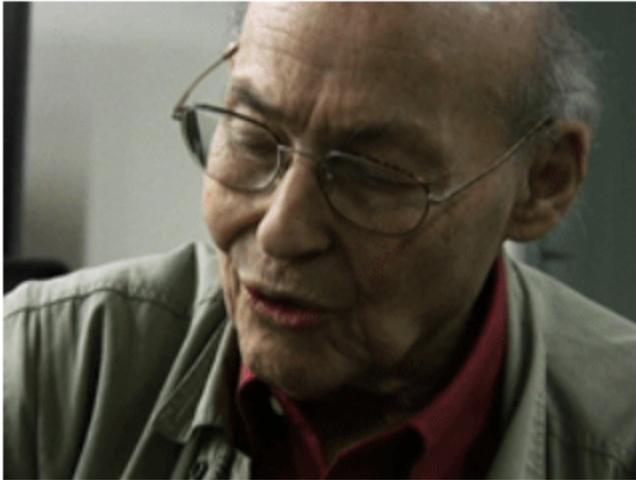
Video Clip
On musical genius:
http://db.tt/aKsiFlt
4 min

Video Clip
Shop talk about Beethoven's Vth:
http://db.tt/YPWqKfC
2 min

Video Clip
On Expectation and Jokes in Musical Structure:
http://db.tt/z71gj8M
2 min

MARVIN MINSKY

Marvin Minsky -- a philosopher and scientist -- is universally regarded as one of the world's leading authorities in the field of artificial intelligence. He has made fundamental contributions in the sectors of robotics and computer-aided learning technologies. In recent years he has worked chiefly on imparting to machines the human capacity for common-sense reasoning. His book Society of Mind is considered a basic text for exploring intellectual structure and function, and for understanding the diversity of the mechanisms interacting in intelligence and thought.

Marvin is a co-founder of the MIT Artificial intelligence Laboratory (with John McCarthy) and the MIT Media Lab (with Nicholas Negroponte). In 1951 he built the SNARC, the first neural network simulator. His other inventions include mechanical hands and other robotic devices; "EUTERP," the first real-time interactive music-performing computer interface; the confocal scanning microscope; the first digital music synthesizer for musical variations (with E. Fredkin); and the first LOGO "turtle" (with S. Papert).

Marvin holds a BA in mathematics from Harvard and a PhD in mathematics from Princeton.

A much fuller biography, a bibliography, and list of awards can be found at his website:
http://web.media.mit.edu/~minsky/minsky.html

TERESA MARRIN NAKRA

Dr. Teresa Marrin Nakra is an expert in the field of Music Technology, with an emphasis on Computer-Human Interfaces, Music Perception, and Affective Computing. Her high-tech interactive conducting experiences ("Virtual Maestro" and "You're the Conductor") have been showcased across the United States and Europe in numerous museums, music festivals, and concert halls. She has has performed professionally as a conductor and violinist, in various opera, symphonic, and new music productions.

Teresa founded and runs Immersion Music, a non-profit organization that provides technical solutions for the performing arts. She holds a degree in Music (*magna cum laude*) from Harvard University and a PhD. from the MIT Media Laboratory. Teresa currently serves as Associate Professor of Music at The College of New Jersey in Trenton.

Much more information can be found at her website:
http://www.tcnj.edu/~nakra/

Major Tasks

* Marvin expands his 1981 paper, *Music, Mind, and Meaning* and chooses musical examples.

* Video a series of interviews between Prof. Teresa Marrin Nakra and Marvin Minsky at several evocative and historically-significant locations, including:

> Phillips Andover
> Claverly Hall, Harvard
> Princeton
> The Media Lab at MIT
> Marvin Minsky's home
> Michael Hawley's home
> Teresa Nakra's home.

* Locate, acquire and digitize relevant archival materials, including:

> Marvin's own vinyl, tape, and disclavier recordings of his musical inventions
> Tod Machover's videotaped musical interviews with Marvin
> historical photographs, published articles, interviews, radio and TV programs
> video and audio tapes made by others.

* Video a series of interviews with several leading musicians, composers, technologists and entertainers (at locations yet to be determined, with or without Marvin). Likely participants include:

Bono	*(songwriter, vocals)*
David "The Edge" Evans	*(guitar, keyboard, vocals)*
Quincy Jones	*(composer, conductor, trumpeter)*
Mari Kimura	*(composer, violinist)*
Karl and Margaret Kohn	*(pianists)*
George Lewis	*(jazz trombone)*
Tod Machover	*(composer, cellist)*
Steve Reich	*(composer, performer)*
Frederic Rzewski	*(composer, pianist)*
La Monte Young	*(composer)*
Penn & Teller	*(magicians, comedy)*
Michael Hawley	
Ken Perlin	
Curtis Roads	
Alan Kay	
Ray Kurzweil	
David Levitt	
Stephen Smoliar	

* Edit the film.

* Build an interactive application (e.g. iPad) from this database of content.

Production Timetable

Marvin rewrites and expands *Music, Mind, and Meaning.*	week 1	week 32

Film the primary conversations between Marvin and Teresa.	week 1	week 14
Rough-edit each conversation and pull the best scenes.	week 1	week 15

Film the interviews with selected luminaries.	week 6	week 24
Rough-edit each interview and pull the best scenes.	week 6	week 25

Rough assembly of the master film.	week 1	week 26
First edit of the master film.	week 26	week 28
Fine edit of the master film.	week 28	week 32

Research, discovery, and outreach for historical media.	week 1	week 29
Gather and digitize historical film, video, audio, and pictures.	week 1	week 30

Conceptual design of the Interactive App.	week 1	week 12
Alpha v 0.1 of the Interactive App interface -- minimal content.	week 12	week 18
Alpha v 0.2 of the Interactive App interface -- medium content.	week 18	week 24
Alpha v 0.3 of the Interactive App interface -- most content.	week 24	week 30
Beta v 0.4 of the Interactive App interface -- all of the content.	week 30	week 36
Release v 1.0 of the Interactive Book.	week 36	week 40

Time Strategy in Brief

Film the conversations between Marvin and Teresa in a relatively short time frame.
Film the interviews with other luminaries over a longer term, as their schedules permit.

Process the relevant archival materials as they are obtained.
Work with Marvin to interweave conversational and musical clips with his Music, Mind, and Meaning text expansion immediately and allow as long as it takes.

Quickly lay out a draft of the interactive app and refine it as pictures, etc. come in.
Complete the interactive app within eight weeks of the end of shooting.

Complete a rough edit of each video interview within one week of shooting.
Pull best clips and add to a rough edit of the master film as they become available.
Complete a final edited film within six weeks of the end of shooting.

The Production Team

MARGARET MINSKY

Margaret Minsky is an internationally-known researcher in the field of haptic interfaces (computational interfaces that simulate objects that you can touch and feel), as well as a contributor in computer graphics, and educational technology. She developed the first technique for creating haptic textures as part of doctoral research at the MIT Media Lab. Her research has been published in conference proceedings and book chapters in the fields of computer graphics, haptics, mechanical engineering, and and educational computation and has served on numerous conference program committees including Siggraph.

Dr. Minsky directed research at Atari Cambridge Laboratory and Interval Research Corporation, and now works as a consultant.

CYNTHIA SOLOMON

Cynthia Solomon is a computer scientist, educator and an inventor of the Logo programming language for children. She has been engaged -- along with Seymour Papert, Marvin Minsky, and others -- in foundational research on children constructing knowledge with computers.

Holding an MS in Computer Science from Boston University and a doctorate in Education from Harvard, Solomon was Director of Atari Cambridge Research Laboratory, a founder of Logo Computer Systems, and author of numerous papers and books. She has been a full-time technology teacher in private and public schools.

BRIAN BRADLEY

Brian Bradley is an independent filmmaker with over thirty years' experience making interactive multimedia and immersive media spaces. When a student at MIT, he enjoyed classes with Marvin Minsky and other luminaries of the artificial intelligence community.

DAVID WILLIAMS

David Williams is an independent audio engineer with decades of experience in music. He has worked on numerous award-winning productions including projects for WGBH and Ray Kurzweil's Singularity project.

BILL LICHTENSTEIN

Bill Lichtenstein is an award-winning print and broadcast journalist and documentary producer. Lichtenstein is president of the independent media production company, Lichtenstein Creative Media. His honors include a Peabody Award; a Guggenheim Fellowship; eight National Headliner Awards; a Cine Golden Eagle award; and a United Nations Media Award. He has

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produced numerous television and radio shows, including the series "The Infinite Mind" and "Voices of An Illness", and has taught investigative journalism at The New School. He holds degrees from Brown and the Columbia School of Journalism.

BETSY CONNORS

Betsy Connors is an artist and educator in holography, photography, and video. She is a former lecturer at the MIT Media Lab and founder of ACME Holography, one of the only private holography labs in the Boston area. A former fellow with MIT's Center of Advanced Visual Studies, Connors has taught and exhibited her work throughout the world. Locally, her photography has been exhibited at the ICA, her video work has been broadcast on public television, and she is a founding director of the former Boston Film Video Foundation. She holds degrees from the Ecole de Beaux-Arts and the MIT Media Lab.

Appendix A

A Long-Term Goal: The Omnibus Minsky

What We Want To Present About Marvin

Marvin Minsky is a mobile, portable machine of thought and invention who has brought himself to individual students and rapt interactive audiences for decades.   He is a terrific writer. His speaking is performance, improvisation, and engagement with individuals. Sometimes he engages with particular audience members as they ask questions, sometimes with the people he is speaking about as he wraps ideas around stories of people. His speaking voice and gesture are memorable. In short, he is a very interesting man.

Marvin has asked us how we can bring his work further into the world, to bring more of himself to more people.

Many paths already lead to Minsky: live lectures and panel discussions, radio and TV appearances, teaching, web sites, interactive multimedia, printed publications, YouTube, podcasts, and chance encounters on the street. Anyone pursuing information about AI, robotics, music, psychology, childhood learning, future technology, life extension, storytelling, or science fiction will eventually encounter Marvin.

However, we have identified a few problems that diminish Marvin's presence in The Cloud.

Problems, Problems

The first problem is that much of his work is unavailable to the general public. Three of his books are out-of-print. Many of his publications have never appeared on-line. Several articles were published in obscure or now-defunct journals that cannot be found in even the largest libraries. Most of his entertaining lectures, keynotes, and Q&A sessions that were recorded in audio or video form are not yet on the web in any form. Some of what exists is hidden behind pay-walls.

The second problem is that access to what materials are available is very fragmented and scatter-shot. Marvin's books pull a great deal of material together, embed them within a common context, and even provide a history and meta-commentary that adds meaning to the individual parts. However, most of his works are floating around in almost a loose-leaf fashion, stripped of context. There is no expert knowledge that points to what should next be seen, and no set of tools that connects meta-commentary and history to a poor isolated paper. There is no Master Index that interconnects the total body of work and provides useful and entertaining ways to navigate through it.

Solutions, Solutions

We want to make the entire corpus of Marvin Minsky's works available and accessible to the general public.

We want to create a definitive Master Index that facilitates easy and entertaining access.

And, we want to create a set of new works that will serve as exciting entry points to Marvin's world, extending the reach and impact of his ideas, and making the experience of discovery more rewarding.

The Omnibus Minsky's First Three Areas of Concentration

Taking that model, we envision three new creations that are needed to fit together with Marvin's existing books (Computation: Finite and Infinite Machines, Perceptrons, The Society of Mind, and The Emotion Machine), his papers, his website, and those of his lectures and conference talks that are informally available on the web. These new creations will be: a music project; a popular book; and a revised edition of the interactive Society of Mind.

Marvin Minsky Music

As described in the attached proposal, the **Marvin Minsky Music** project explores the role of music in Marvin's life, opening a gateway into his research, philosophies, and artifacts from his life. The primary products of this exploration will be a documentary film and an interactive multimedia book.

Best Written Works Collection

Marvin will edit a popularly-oriented book of collected *best work* -- approximately twenty papers -- with a new forward and afterword for each paper. This will be distributed be in print as well as a straightforward e-version. A more ambitious version of this work will include selected lecture transcripts.

We have collected Marvin's writings from published and less visible sources, and made a first-pass selection of the papers, interviews, and memoirs that will be included. We have also collected a set of lectures that have been previously transcribed (but never edited), and several that have never been transcribed.

Society of Mind Interactive

Another active project is a revised version of the interactive *Society of Mind* made with Voyager in 1992. The CD is has long been out of print and the technology to play it has all but vanished from the earth, but it was a delightful and playful thing. The new version might keep the size, look and feel, and all the assets of the original (the full-text of the book, commentaries, a tour of Marvin's Living Room, embedded movies, an Ideas Index, and the ability to add personal annotations to the text). Or, we may update the presentation to accommodate today's larger screen sizes and include some new material. This new interactive book could take the form of an iPad app, a cross-platform app, or a Web environment.
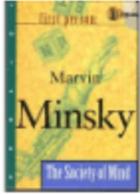
Models for The Omnibus Minsky

The collective published works by and about Richard Feynman provide a model for us particularly because each work provides a different access point "according to the way a person has already met Feynman". Also, Feynman was a great friend of Minsky and they shared a view of the world: that iconclastic genius is commonsense and fun.

Some books that provide models or are related in content include: R. Trivers' 2002 book of his seminal papers with fore- and afterwords, Natural Selection and Social Theory; Feynman's 1996 and 1997 collections of lectures and anecdotes Six Easy Pieces and Surely you're Joking, Mr. Feynman; K.C. Cole's 2009 book about Frank Oppenheimer and the Exploratorium And Something Wonderful Happens.

A model for the music documentary is the movie In Search of Memory about Eric Kandel.

The Society of Mind Interactive DVD is its own model, it is one of the best interactive e-books ever made.

Appendix B
More Resources for Minsky and Music

Background on Minsky's relationship with music

Hockenberry Video Clip: Hockenberry/Minsky 5 min: http://db.tt/s28t4Aw

Radio and TV programs, including BBC radio commentary 22 min: http://web.media.mit.edu/~minsky/BBC3.mp3 (Music 0->2:00, Emotions 2:00->11:30, Music 11:30->22:00)

Music, Mind, and Meaning paper: http://web.media.mit.edu/~minsky/papers/MusicMindMeaning.html

Published interview with Otto Laske: http://www.aaai.org/ojs/index.php/aimagazine/article/view/1009/927

Published interview with Curtis Roads: Computer Music Journal, Vol. 4, No. 3

Themes from Music, Mind, and Meaning collected by T. Nakra

Themes from "Music, Mind and Meaning" could first be refined (some culled, some modified) and then fleshed out with real music examples. Each fleshed-out theme could comprise a comprehensible unit in and of itself. Here's my basic list:

Themes from Minsky on Music, Mind and Meaning

1. Why do we like music? Why do we have music, and let it occupy our lives with no apparent reason? (When no idea seems right, the right one music seem wrong.)

2. Debunking the false notion of universals in music

3. Listening to music engages the previously acquired personal knowledge of the listener.

4. Music theory is not only about music, but about how people process it. (Yet not through MRIs!)

5. Sonata as Teaching Machine
  a. This whole section is great and could be realized as an animation – perhaps someone like Golan Levin could be contacted to make such a thing?

6. The nature of musical memory
 a. Themes might not be repeated verbatim from memory, but can be recognized when heard. The music itself teaches us a way to hear it.

7.What use does music have?
 a. Syntax
 b. Space
 c. time

8. The role of composers and conductors

9. Rhythm and Redundancy

10. Sentic significance
11. Theme and Thing