Mitch Wand:
Mensch, Teacher, and Scientist
(Part 1)

Olivier Danvy & Dan Friedman
Aarhus University & Indiana University

Boston, MA 23 August 2009
Explaining the title

“Mitch”: short for “Mitchell”
Explaining the title

“Wand”: nothing magic, it’s just his family name.
Explaining the title

“Wand”: nothing magic, it’s just his family name.

(Now whether you think there is something magic about Mitch is another matter.)
Mensch

“Mensch” (Yiddish: mentsh) means “a person of integrity and honor.”
Leo Rosten on Mensch

“Someone to admire and emulate, someone of noble character.”
Leo Rosten on Real Mensch

The key is nothing less than

• character,
• rectitude,
• dignity,
• a sense of what is right,
• responsible, and
• decorous.
Plan

1. Mitch the scholar
2. Mitch the family man
3. Mitch the mentor
4. Mitch the teacher
5. Mitch the researcher
6. Mitch’s service to the community
7. Mitch the aphorist and trendsetter
1. Mitch the scholar

1. 1985-present: Professor, Northeastern U.

2. 1984-1985: Visiting Professor, Brandeis U.


4. 1977-1983: Associate Professor, Indiana U.

5. 1973-1977: Assistant Professor, Indiana U.

Mitch’s education

- 1973: Ph.D. in Mathematics, MIT.
- 1969: S.B. in Mathematics, MIT.
- 1965: Mepham High School.
Mitch’s fellowships

2007: ACM Fellow


1969–1973: NSF Graduate Fellow, Stanford U. and MIT
Mitch’s knighthood

De facto Knight of the $\lambda$-calculus, for:

- “Compiling lambda expressions using continuations and factorizations” (1978)
- “Continuation-based multiprocessing” (1980)
- “Continuation-based program transformation strategies” (1980)
Mitch’s lightsaber
Plan

1. Mitch the scholar
2. Mitch the family man
3. Mitch the mentor
4. Mitch the teacher
5. Mitch the researcher
6. Mitch’s service to the community
7. Mitch the aphorist and trendsetter
2. Mitch the family man

- November 6, 1948: born in Philadelphia, PA; grows up in Bellmore, NY.
Mitch on the move at 9 months old
Mitch at 4
Mitch at 6
Mitch at 16
Mitch as a freshman at MIT
Hello happy driver
Portrait of Mitch as a young man
Portrait of Mitch as a young man (cont’d)
A sharp change

Mitch’s life is about to take on some color.
Dec. 13, 1969: Mitch meets Barbara
June. 14, 1970: Mitch weds Barbara
2. Mitch the family man (cont’d)

- April 16, 1974: birth of Rebecca.
Mitch as a young father
The happy parents
The happy parents (cont’d)
Mitch the seasoned father
Anime sana in corpore sano

Early 1990s: takes up golf with Josh.

Mid-1990s: starts taking jazz piano lessons.
And swimming too!
2. Mitch the family man (cont’d²)

1999: Rebecca gets married.


2005: Joshua gets married.

May 23, 2006: Mitch becomes grandfather of boy, Noam.

2007: Jennifer gets married.
Plan

1. Mitch the scholar √
2. Mitch the family man √
3. Mitch the mentor
4. Mitch the teacher
5. Mitch the researcher
6. Mitch’s service to the community
7. Mitch the aphorist and trendsetter
Separating concerns

The Buck rule.
3. Mitch the mentor

10 PhD students and more to come!
10: Dave Herman

- Programming language design and specification, hygienic macro systems, embedded and domain-specific languages, advanced control constructs, program analysis, and expressive programs with expressible proofs, to say nothing of JavaScript.

- PhD student.
9: Vasilieos Koutavas

• graduated in 2009

• concurrency, programming languages, and proving interesting properties about the behavior of programs

• postdoctoral research fellow at Trinity College, Dublin, with Matthew Hennessy
8: Galen Williamson

- graduated in 2004
- event models, control-flow analysis
- at MITRE
7: Igor Siveroni

- graduated in 2001
- formal frameworks for program analyses and their application to program optimization and verification
- Imperial College, London, UK
6: Gregory T. Sullivan

- graduated in 1997
- functional language implementation, program specialization for AI
- principal engineer at BAE Systems Advanced Information Technologies
5: David Gladstein

• graduated in 1995

• distributed programming language design and implementation

• software engineer in San Francisco
4: Paul Steckler

- graduated in 1994
- lightweight closure conversion
- working at a government-sponsored startup building a static analysis (bug-finding) tool in Sydney, Australia.
3: Dino P. Oliva

- graduated in 1993
- semantics-based compilation and verification (VLISP)
- software architect at Bloomberg, New York
2: William A. White

- graduated in 1990
- programming languages
- software engineer
1: Margaret Montenyohl

- graduated in 1986
- semantics-based program analysis
- Cary, North Carolina
0: and also...

• undergraduate students
• graduate students
• post-docs
• visitors
Plan

1. Mitch the scholar √
2. Mitch the family man √
3. Mitch the mentor √
4. Mitch the teacher
5. Mitch the researcher
6. Mitch’s service to the community
7. Mitch the aphorist and trendsetter
4. Mitch the teacher

- his teaching themes and how they have fueled his research
- the textbooks he (co-)authored
Mitch’s teaching and research themes

- Programming
- Programming languages
- Semantics and logic
- Program verification and construction
Mitch’s textbooks

- “Induction, Recursion and Programming” (1980)
- “VLISP: a Verified Implementation of Scheme,” with Josh Guttman (1985)
Plan

1. Mitch the scholar √
2. Mitch the family man √
3. Mitch the mentor √
4. Mitch the teacher √
5. Mitch the researcher
6. Mitch’s service to the community
7. Mitch the aphorist and trendsetter
5. Mitch the researcher

Published well over 100 articles.
2009

“A separation logic for the pi-calculus”

Has already elicited the interest of, e.g., Sir Tony Hoare.
2006

“On the correctness of the Krivine machine”
2005

“Bottom-up beta-reduction: uplinks and lambda-DAGs”

with Olin
2004

“Relating models of backtracking”

with Dale Vaillancourt
2003

“CPS Transformation of flow information”

with Jens Palsberg
1998

“The theory of Fexprs is trivial”
1997

“Lightweight closure conversion”

with Paul Steckler
1995

“The VLISP Verified PreScheme Compiler”

with Dino and John Ramsdell
1991

“Correctness of procedure representations in higher-order assembly language”
1990–1994

“Conditional lambda-theories and the verification of static properties of programs”

with Zheng-Yu Wang
1987

“A simple algorithm and proof for type inference”

One of the most cited papers of Fundamenta Informaticae.
1988, 1986 and 1984

• “The mystery of the tower revealed: a non-reflective description of the reflective tower”

• “Reification: reflection without metaphysics”

with Dan
1985: the birth of call/cc

“A scheme for a higher-level semantic algebra”

with Will and Dan
1985

- “Embedding Type Structure in Semantics”
- “Continuation Semantics in Typed Lambda-Calculi” with Albert Meyer
“Semantics-Directed Machine Architecture”

“Deriving target code as a representation of continuation semantics”
1978–1980

“Continuation-based program transformation strategies”
1978–1980

“Continuation-based program transformation strategies”

What did Mitch look like by then?
1975–1978

“Compiling lambda expressions using continuations and factorizations”

with Dan
Plan

1. Mitch the scholar √
2. Mitch the family man √
3. Mitch the mentor √
4. Mitch the teacher √
5. Mitch the researcher √
6. Mitch’s service to the community
7. Mitch the aphorist and trendsetter
6. Mitch’s service to the community

Workshops, symposiums and conferences:

- Program committee member (POPL, LFP, LICS, OOPSLA, FPCA, CW, PEPM, PADL, AOSD, WFAL, Scheme, ESOP, FOOL, FOAL, ICFP).
- Program chair (LFP, ICFP)
- General chair (ICFP).
Mitch’s service to the community

Editorial boards:

- Journal of Functional Programming
- Information and Control
- Mathematical Structures in Comp. Science
- Logical Methods in Comp. Science
Mitch’s service to the community

Steering committees:

• Scheme Workshop
• Scheme Language
• ICFP
• Continuation Workshop
Mitch’s service to the community

- Funding agencies.
Plan

1. Mitch the scholar √
2. Mitch the family man √
3. Mitch the mentor √
4. Mitch the teacher √
5. Mitch the researcher √
6. Mitch’s service to the community √
7. Mitch the aphorist and trendsetter
7. Mitch the trendsetter

- Content: has a cunning sense of the interesting problem and how to solve it elegantly.

- Form: has a noticeable sense of words ("mutatis mutandis", "morass", "mumble"...)

- Generosity.

Has a visible impact.
7. Mitch the trendsetter

- Content: has a cunning sense of the interesting problem and how to solve it elegantly.

- Form: has a noticeable sense of words (“mutatis mutandis”, “morass”, “mumble”...)

- Generosity. (He is a real Mensch.)

Has a visible impact.
Mitch the aphorist

When asked whether he prefers call by name or call by value:

“I prefer call by value because it is so much more predictable.”
Cunning Mitch

“And this is a detail that we want to study in detail.”

(LICS 1990)
Logical Mitch

About the fork calculus:
Logical Mitch

About the fork calculus:

“How does the fork calculus help one to solve the dining philosophers problem?”
Recap

1. Mitch the scholar ✓
2. Mitch the family man ✓
3. Mitch the mentor ✓
4. Mitch the teacher ✓
5. Mitch the researcher ✓
6. Mitch’s service to the community ✓
7. Mitch the aphorist and trendsetter ✓
To be continued