Building a Career on the Kindness of Others\textsuperscript{1} or
Being in the Right Place at the Right Time\textsuperscript{2} or
When You Come to a Fork in the Road\textsuperscript{3}

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1. With apologies to Tennessee Williams and Blanche Dubois
2. E.g., see \textit{Forrest Gump}
3. With thanks to Yogi Berra
BITRP#1 & KOO#1

- New Jersey (1968)
  - With thanks to Ma Bell, Lady Bird Johnson, and Mike Rabins

**Lesson#1:** Internships can and should be much more than summer jobs

**Lesson#2:** The “dual” of a well-known phrase about the relationship of theory and practice (more later)
New Jersey (1969): Bell Labs #2

- Lament from my mentors about MIT’s loss and strong recommendations for my graduate pursuits
  - Heartfelt thanks to Shelly Horing, Harry Heffes, Len Forys, Jack Holtzman
  - Rejoicing in my Hertz-based good fortune that allowed me to consort with our “friendly rival” and meet Roger Brockett
BITRP#2, WYCTAFITR#1, and Trauma#1

- Trauma #1: My (shaky) introduction to research (1969-1970)
  - Roger’s challenge: Optimal estimation on Lie Groups

- RP#2 and FITR#1:
  - Fenway Park and Dynamic Systems on Finite Groups
    - The first half of Lesson#3
KOO#2 and Lesson #3

- Roger’s “horrifying” and upsetting suggestion
  - What about the simplest Abelian Lie Group
- Lesson #3: It is easy to formulate really hard problems that, taken head on, are impossible to solve.
  - Much of the real creativity is in finding problems that push the envelope of what we understand and are not impossible
  - The thoughts of two individuals
Lesson #4-5, KOO #3-4, and Trauma #2

- Trauma#2 (Roger)

- KOO#4: Sanjoy Mitter
  - Lesson#4: Scholarship is much more important than I thought
  - A continuing responsibility: Imparting that to your students

- KOO#3: Roger and Wally Vander Velde
  - Lesson#5: Scientific writing is much more important than I thought
  - A continuing responsibility: Imparting that to your students
BITRP#3-4, WYCTAFITR#2, & KOO#5-6

- BITRP#3 & FITR#2: A bit of chutzpah and a different challenge
- BITRP#4: Consulting at Draper Labs
  - KOO#5: Automatic detection of arrythmias in EKGs
- KOO#6: Failure Detection for NASA’s F-8 DFBW Aircraft
- Lesson#6: In practice, you don’t have the same freedom in problem formulation that you have in developing theory
- Lesson#2 revisited and reinforced: The value of applied engineering in stimulating and guiding theory
KOO#7: Al Oppenheim pays me a visit with two invitations

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*Signals and Systems* and its influences on my views of
- Pedagogy
- Scientific education
- The importance of writing

A plenary exploring relationships between my then current and then future fields
- Lesson #3 revisited: It is the **hunt** that is often the best part
- Lesson #7: While it might be a sign of a short attention span, I really **like** looking at relationships between fields and bringing perspectives from one to problems in the other
BITRP#5 and KOO#8/9: Al O. introduces me to Schlumberger

- A 1\textsuperscript{st} encounter: “What information are you trying to extract?”
- Encounter\#2: Hearing a talk by this guy from WHOI

- A push into “goal-oriented” signal processing, and inference and extraction of geometric information for spatial phenomena
  - With thanks to Dave Rossi, Jerry Prince, and Peyman Milanfar
BITRP#6 & KOO#10-11

- Mike Athans, Nils Sandell, and ALPHATECH

- Lessons #2 & 6 revisited and amplified
  - A perspective on what it means to “deliver”
  - A complementary part of my professional life and an education
Sabbaticals in Paris (1980-81) and Rennes (1988)

- 1980-81: Convolutions and transforms in the City of Light
- 1980-81 and then 1988: Albert Benveniste and Michelle Basseville
Initial steps down Fork #4, and KOO#14-20

- Multiresolution “dynamic systems”
  - Models for multiresolution *synthesis*

- (And eventually a rapprochement with wavelets)

- A variety of applications, by our group and by others
  - Image processing
  - Oceanography
  - Groundwater hydrology
  - Helioseismology
  - .............
F’rinstance (and KOOs#21-24)

- Exploiting the presence of multiple scales in the ocean

- Multiresolution models in groundwater hydrology
While walking down Fork #4, here comes WYCTAFITR#5 and KOO#25-29

- Tony Yezzi comes for a stay and curve evolution pays a visit
A realization, while strolling down Forks #4 & 5

- I was changing fields *again*: Machine learning seemed to be my home
  - A realization assisted by KOO#20, with special thanks to Mike Jordan, Martin Wainwright, and Erik Sudderth

- Although I still am on speaking terms with systems, control, and signal processing

- A reprise of Lesson #7
  - I really like working across disciplines
Lesson #8: Listen to and learn from your students, as they are the best “others”

- Beating the life out of Gaussian graphical models
- Some (I think) innovative ways to construct graphical models

- And forays into dynamic Bayesian nonparametric models
So, what are the final lessons?
Certain authors, speaking of their works, say 'My book,' 'My commentary,' 'My history,' etc… They would do better to say 'Our book,' 'Our commentary,' 'Our history,' etc., because there is in them usually more of other people's than their own.