Is there a researcher in you?

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Why did I become a researcher?

“Modernization of Industry, Agriculture, Military, and Science”, 1978
“China and Europe aren’t standing on the sidelines, and neither should we,” he said. “We know that the nation that goes all-in on innovation today will own the global economy tomorrow. This is an edge America cannot surrender. Federally funded research helped lead to the ideas and inventions behind Google and smart phones.”

SOTU, 2014
Research as a Career

- Global (long-term) optimization vs. Local (short-term) optimization
  - Passion on research (vs. innovation)
  - Work hard and consistently

- "T" shaped talent
Skill Set as a Researcher (in CS)

- Abstract thinking (high-level)
- Problem Formulating + Solving (detail)
- Communication (Writing + Presenting)
- Quick learning
- Math + Programming
- Motivation + Vision
- Leadership & accountability
  - Independence, team-work, mentoring
  - Result oriented
- Personality
  - Self-critical, open-minded, highly efficient
Maximizing Your Potential

• A computational model?

\[
\text{Career Potential} = f \left( \text{Long-term Goal} , \text{Short-term Goal} , \text{Focus} , \text{Skill Set} , \text{Work-life Balance} \right)
\]

• PhD study is the first time (and best time) in your life to try and tune this potential function \textit{(staging)}
  – Know yourself: what do you like to do? what are you good at (and not good at)?
  – Work with a mentor
  – Focus on one area that has impact
  – Build a personal brand: expert in an area, accountability, doing it the right way, quality of work, and marketing yourself
Success You Can Measure

Everyone has enough potential

Success is a choice
  Knowing your own strengths and weaknesses
  IQ is not everything, EQ also matters

Put yourself in the position to succeed
  Fortune favors the prepared

Set small goals
  Attainable (hint: not Turing Award, AAAI/IEEE Fellow, or founding the next Facebook)
  Doing a good job on a project or a paper is a fine goal
For The Love Of The Game

Love what you do, do what you love
   You will only succeed in what you are passionate about
   Do what you love and you will never have to work for another day
   “meet with Triumph and Disaster and treat those two Impostors just the same” - Rudyard Kipling

Relentless pursuit of your passion
   There are always something new to be discovered
   There is no finish line (only endless deadlines)

The right mind set
   Victory is by defeating opponent, success is by proving yourself
   When you better yourself, it is often enough to win
Success You Can Measure

Have a role model
Focus on his traits, not achievements
Passion and scholarship

Set small goals
Attainable (hint: not IEEE Fellow)
Do a good job on a project or a paper is a fine goal
Do it the Right Way

The Old Fashion Way
You earn it
You are a brand, and it’s more important than grades and papers
Resist taking short cut

See what you do
Image processing and computer vision are not just about number crunching

功到自然成 (Success You Can Measure)
Constant hard work naturally yields success
Build confidence and competence gradually
Work with the advisor the right way 师傅领进门，修行在个人
Resist temptations and impatience
Stay Focused

Stay motivated
   set higher and higher bars

Stay focused
   no one is superman

Stay happy
   enjoy your achievements
   have some fun outside research
Career Stages

- New & advanced knowledge worker
- Intermediate knowledge worker
- Senior knowledge worker
- Director
- Vice president or entrepreneur

IEEE Career Stages
Industry versus Academia

Say you got your PhD
Make your two bosses happy
Usefulness (relevance)
Novel (novelty)
Is there a PhD/researcher in you?
Is doing research right for you?

Your Personal Brand
Passions | Strengths | Persistence
Differentiates from competitors

Know your strengths
A good student may not be a good researcher, a good researcher may not be a good teacher

Align your long-term goals with your strengths and passions
Business, Management, Research, Product Development, Operations

Take a right approach
E.g., Research → Research → More reading → Impactful problems → Solvable? → Timely
Publish

Find a great boss who can maximize your potential 😊
Mentor, friend, collaborator,
Invention versus Innovation

**Invention**
- Something totally new and unique
- A new device, method, or process developed from study and experimentation

**Innovation**
- Extracting values from the creative understanding of what is already known.
- A mindset training

**Transform money into Knowledge**
- Where were DRAM, LCD, Ethernet, DSC invented?

**Transform knowledge into money**
- Who are making money from DRAM, LCD, Ethernet, DSC?