Find Yourself
A Research Direction

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Q: To think about what?

A: To think about finding a research direction today
“A journey of a thousand miles begins with the first step”
― Lao Tzu （老子，5th Century BC）

For a postgraduate student:
find a research direction to begin
Be patient at the start …

A typical 3-phase curve

Slow start → Rapid develop → Mature

First step

“Wish I could be here”
Be confident about yourself

Examples:

Charles Hermite (1822-1901)

André-Marie Ampère (1775-1836)

Michael Faraday (1791-1867)

George Green (1793-1841)

James Joule (1818-1889)
Be confident about yourself

You can do it if you believe you can

“Your success will be determined by your own confidence and fortitude.”

— Michelle Obama
A Great Scientific Achievement May Not Be Very Difficult

Isaac Newton (1642-1726) considered light to be consisting of particles

Some Doubt by

Christiaan Huygens (1629-1695)
Robert Hooke (1635-1703)

In 1801, the 28-year old Thomas Young (1773-1829) performed a now-famous Double-slit Experiment

T. Young, “Experiments and Calculations Relative to Physical Optics”
A simple experiment demonstrated that light consists of waves.
Always have a **strong desire** to do **new** research

**Examples:**

- **Literature** — Novelist has strong desire to write new stories
- **Music** — Composer has strong desire to write new songs
- **Painting** — Artist has strong desire to paint new portraits
Be sensitive to new ideas and emerging trends

Literature Review
   — To know the state of the art and get inspirations

Especially recent publications of research papers, news reports, public science articles

Listening to Seminars and Visionary Talks
   — If the topics interest you
Learn new developments within your scope
Be realistic to select and decide

Very often, you have choices to select a research topic

You need to decide where to invest your time and energy
A Few Things to Do

Think about your background and ability

Ask your advisor for suggestions

Discuss your plan with peers

Be persistent and determined
Words rarely are enough
Example is better than precept

How I Started Complex Networks Research
Once I was looking for a research direction

1990s: Synchronization of two oscillators

2000: Synchronization of many oscillators
Thinking … When there are many oscillators, there is a connectivity issue: How are they coupled together?

This is a networking problem: What kind of networks?

Regular Networks:
tree (chain, star), ring, lattice, fully-connected, 
……
More generally?
Literature Review

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Earliest Papers on Synchronization in Complex Networks


Opened Up a New Research Direction on Complex Networks in China

1st Chinese Conference on Complex Networks (2005)
......
20th Chinese Conference on Complex Networks (2024)
“A good decision is based on knowledge, not on numbers.”

Plato (428-348 BC)

Plant a new tree, not simply trim the leaves

- Try to be innovative and creative
- Try to develop original work, not simply modified
- Try to do sustainable research, not just publishable

50° + 50° → 100°

Quality, not just quantity
Wish You Good Luck!