

# Soft Skills for PhD Researchers

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# Introduction

- Not about technical skills
- Not about obvious skills (e.g., motivation, timeliness, initiative)
- Some of the skills are specific to NLP
- Not in any specific order
- Not intended to intimidate, but to help
- Try an annual self-assessment!
- Feedback welcome!

Ability to build evaluation pipelines and perform evaluations for new tasks

Ability to locate and read the relevant papers  
on a new problem

Ability to come up with "easy" and  
"reasonable" baselines

Ability to find, download, install, and run existing software from third parties

Familiarity with machine learning, graph theory,  
linear algebra, calculus, combinatorics, statistics,  
and text processing

# Understanding of linguistic phenomena and annotation



# Understanding the variability of human judgments

Ability to write good narratives of experiments

Ability to write good overviews of existing research

Ability to develop and give presentations

Ability to discuss research with other team members

Ability to see a problem or an approach from  
a very broad perspective

Ability to assess the feasibility of a problem  
or approach

Ability to plan a research project and execute it over time



Intuition to try alternative methods

Willingness to give and receive help from the team

Understanding of the relative advantages and drawbacks of general methods across problems

Ability to implement in code generic algorithms  
and to make appropriate modifications to them

Understanding of related areas such as bioinformatics, statistics, etc.

# Understanding of computational complexity

# Understanding of the fundamental data structures and algorithms

Familiarity with the availability on the Web of relevant corpora, papers, and tools



Excellent understanding of UNIX, including process control, scripting, and backup

Ability to build web-based and local demonstration systems

Ability to describe one's research to others with different levels of overlap in backgrounds with the student's

Understanding of project management: github,  
documentation, modularization, portability of  
code

Knowledge of a number of programming languages: C/C++, Java, perl, python, matlab

Ability to plan one's time, esp. wrt. courses,  
travel, committees

Ability to read a paper and abstract its main points – both strengths and weaknesses

Ability to draw charts, diagrams, screen snapshots, and other illustrations for papers



Ability to write quick scripts to convert data from one format to another

Ability to write quick scripts to test existing libraries or external software

Ability to write quick scripts to evaluate experiments

Ability to teach introductory classes, as well as plan it and grade it

Ability to relate one's work to similar problems in related research areas

Ability to store and retrieve data in a  
database systems

Ability to write interfaces to existing resources: both local and Web-based

Ability to network with colleagues



Ability to promote oneself

Ability to organize events: colloquia, external visits, etc.

Ability to build an end to end system

Ability to take initiative and to propose new projects

Ability to write proposals for funding

Ability to elicit assistance from advisers,  
fellow students, and others

Ability to ask intelligent questions at talks

Ability to exploit available opportunities



Ability to create and exploit unique data sets

Ability to design and perform user studies

Ability to request and obtain IRB support for user studies

Knowledge of a range of research methods, and an ability to read and give feedback on colleagues' work, even in other areas

Ability to initiate collaboration with others

Knowledge of people who can give you  
helpful feedback on your work

Knowledge of research communities in which to become an active member, get good feedback on his or her work and get exposure of his or her work to others

Awareness of one's strengths as a researcher and future teacher (for people with academic career aspirations).



Ability to emphasize one's strengths and use them to have impact

Sharing code (e.g., github)

Advertising/outreach/blog posts

Looking for hidden doors that will open for  
you

Ability to keep your commitments

Motivation to exceed expectations

Strong mathematical background

Ability to replicate papers



Keep track of new developments

Ability to cope with impostor syndrome

Ability to ask for help

Ability to keep a research diary

Motivation to write a few sentences each day

# Academic honesty

Keeping track of the big picture

Interests in related subjects



Ability to find the right data

Ability to maintain a work-life balance

Patience

Ability to organize your daily routine

Ability to make the most of internships

Ability to make the most of conferences

Ability to supervise undergraduate students

