UC San Diego

Instructions to Get Your Hands Dirty

Presenter: Hao Su

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Exciting Moment!

credit: https://innerwill.org/time-get-hands-dirty/

Now we have decided the topic and read some papers,

Time to Make Action Plan!

Let us go over something you should know for plan creation

Knowledge Point I: The Exploration-Exploitation Dilemma

By March, J.G. (1991), *Exploration and exploitation in organizational learning.* Organization Science, 2, pp. 71–87,

- *Exploration:* search, variation, risk-taking, experimentation, play, flexibility, discovery, and innovation
- *Exploitation:* refinement, choice, production, efficiency, selection, implementation and execution

For Deep Learning Projects,

- *Exploration:* read literature, download released codes and test run, write prototype codes, . . . , *any action to get basic ideas and propose what to do next*
- *Exploitation:* tune parameters, ablation study, visualize feature maps, . . . , *any practice to push the method to the limit*

The issue of balance emerges as exploration and exploitation activities are subject to resource constraints, resulting in a trade-off situation. As an organization has limited resources, it faces a choice of which activities to invest in. If it decides to invest heavily in exploitation, it has fewer resources available for exploration and vice versa. This results in an inherent tension as the leveraging of existing capabilities leads to more immediate results and the development of new capabilities promises future advantages (Leonard-Barton 1995).

credit: Solutions to the Exploration/Exploitation Dilemma: Networks as a New Level of Analysis, IJMR, 2013

Requirement I of Your Plan:

Include the Exploration-Exploitation Cycle!

. . . Therefore, organizations need to explore to create new opportunities to exploit, and it needs to exploit to generate income to invest in exploration.

credit: Solutions to the Exploration/Exploitation Dilemma: Networks as a New Level of Analysis, IJMR, 2013

Requirement I of Your Plan:

- Structure your plan as exploration stage and exploitation stage;
- Setup clear milestones to separate exploration/exploitation
- Define the goal of each stage clearly (e.g., to replicate codes, or to compare results of existing methods);
- Iterate between exploration-exploitation.

Knowledge Point II: The Planning-Execution Dilemma

Common issues:

- you have made an ambitious plan, but it is too vague and unclear to be executed in limited time;
- you have a marvelous plan, but it requires enormous resources (e.g., use GPT-3 in this class);
- you plan very far, but the execution just fails at the beginning stage;
- you spend a long time and make a perfect plan, yet you do not have the time to execute it.

Requirement II of Your Plan:

Executable and Incremental!

Requirement II of Your Plan:

- Consider the real skills you have mastered. Be incremental and do not be too ambitious;
- Decompose your plan into small and clear steps;
- Evaluate every small step (unit test) thoroughly.
- Finally, the good execution of an imperfect strategy is better than the delayed execution of a perfect strategy. You can adjust by feedbacks;

What we shall discuss in W3:

- The plan of the team;
- The plan of each individuals in your team;
- Be clear of the responsibility of each person (e.g., at the exploration stage, which paper to replicate)
- If you move fast, any initial results.