UC San Diego

JACOBS SCHOOL OF ENGINEERING

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DATA MANAGEMENT

The Jacobs School of Engineering aspires to rigorous data management practices supporting the structural foundation for research findings. If the data lack validity or integrity, then all else about a research project will not matter. Depending on the nature of the research, data can be as diverse as numbers written in a lab notebook, images produced with an electron microscope, audio recordings of interviews with human subjects, genetically modified cell lines, customized software or codes, artifacts collected from an archaeological dig, or geological samples from the sea floor.

Because data have so many different forms, it is not practical to be prescriptive about how all data should be handled. However, as a minimum, ***research records should be sufficient to reconstruct what was done*** for the purpose of future research and to verify work had been done as described in subsequent publications.

Some recommended, nominal "best practices" are that ***each research group should be clear about how the following questions are answered*** for their particular circumstances, and re-assess periodically as those circumstances change:

- Are there data that ***should not be acquired***?
- How will the data be ***collected***?
- How should records be ***kept and stored***?
- Is ***data curation*** (e.g., organization, annotation) sufficient to reconstruct what was done?
- How, if at all, will data be ***backed up***?
- ***How long*** should data be kept?
- What ***factors other than regulatory*** might alter how long the data should be kept?
- ***Who owns the data***?
- When and with whom should data be ***shared***?

In addition, some key considerations relevant to the specific circumstances of most, if not all, research projects are that researchers should:

- Recognize that ***research ownership typically passes*** from research funders (e.g., a federal agency such as the NIH or NSF, or a private funder) ***to the University***, not to the research investigators. The University does not normally make decisions about what will be done with research data, but has legal standing to do so. For this reason, a researcher leaving the University must negotiate approval with the University before removing data. ***For all other practical purposes, rights of ownership largely belong to the head of the research group.***
- Verify specific requirements of funders of their research for ***how long research records must be kept*** (e.g., research records must be kept for ***at least 3 years after the final report*** for research funded by the National Institutes of Health (NIH) or National Science Foundation (NSF)).
- Maintain ***data and records essential to a patent*** throughout the lifetime of the patent.
- Obtain approvals as needed for ***research with human or animal subjects*** from the Institutional Review Board (IRB) or Institutional Animal Care and Use Committee (IACUC), respectively, and follow data safety and management plans specific to the project. [NOTE: Any research, including Internet studies, involving humans may need review]
- Honor expectations of many journals, funding organizations and agencies (e.g., NIH and NSF) for which publication and funding are ***contingent on plans to share research data and products***.
- Obtain necessary review and approval, consistent with restrictions on ***export controls, protection of intellectual property, and University policies***, for any transfer of data, materials, or intellectual property, outside the University.