

How I Pick a Research Project

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1 November 2019

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USM SCS

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Genomics Building, Loyola
campus



EV Building, downtown

Gregory Butler, Professor, Computer Sci & Software Eng

Co-Founder, Centre for Structural & Functional Genomics

Director, Data Science Research Centre

Computational Group Theory 1975–1991

Algorithms, Language Design, Knowledge Engineering

Software Engineering 1991–2010

Frameworks, Architectures, Refactoring, Knowledge Management

Bioinformatics 1995–now

Algorithms, Data & Knowledge Mgt, Ontologies, Provenance

Big Data 2010–now

Data-to-Application, Open Science, Knowledge Graphs

How I pick a research project

I look for

- ▶ a topic that interests me
- ▶ a problem that is challenging
- ▶ a problem that fits with my larger research agenda
- ▶ collaborators that I like to work with

My Long-Term Research Agenda

Automate Problem-Solving

How to automate steps of problem-solving

- ▶ organization of facts, assumptions, goals
- ▶ processing: algorithms, analogy, reasoning
- ▶ persistence when things go wrong

Knowledge Management

- ▶ knowledge organization
- ▶ knowledge creation
- ▶ knowledge testing, correction, refinement
- ▶ knowledge application

Problems — Theory and Practice

How to transform data to information to knowledge to application?

How to develop “good” software for this?