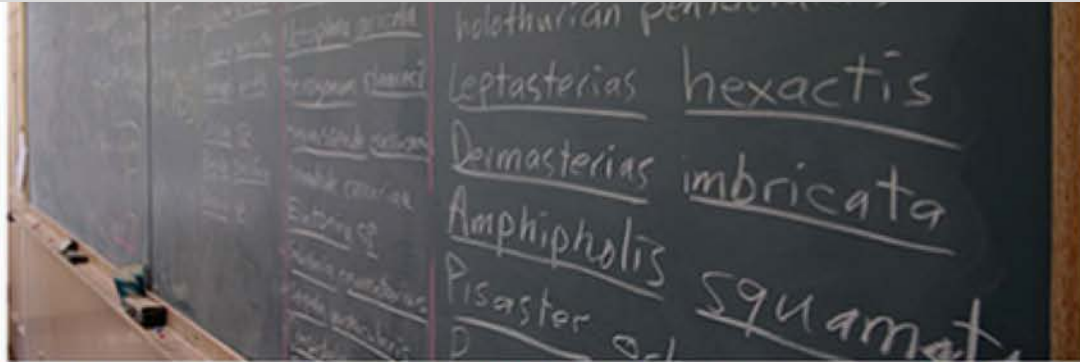




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Research Development
Services

**OVPRI Interdisciplinary Seed Funding Program:
Data Science Research
Deadline: October 15, 2019**



What is Data Science?

- Interdisciplinary field focused on extracting knowledge from diverse types of big data
- Big Data
 - There is a great deal of it (volume)
 - Generated rapidly and continuously (velocity)
 - Taking many different forms and types (variety)
 - Originating from trustworthy sources (veracity).
- Data Analytics
 - Novel ways of extracting useful information from data
 - Math is important for data analytics, but it is not sufficient
 - Modern statistics and computation are crucial
 - As are interpretation, decision making and communication



What are the Skills of a Data Scientist?

MATH & STATISTICS

- ☆ Machine learning
- ☆ Statistical modeling
- ☆ Experiment design
- ☆ Bayesian inference
- ☆ Supervised learning: decision trees, random forests, logistic regression
- ☆ Unsupervised learning: clustering, dimensionality reduction
- ☆ Optimization: gradient descent and variants

DOMAIN KNOWLEDGE & SOFT SKILLS

- ☆ Passionate about the business
- ☆ Curious about data
- ☆ Influence without authority
- ☆ Hacker mindset
- ☆ Problem solver
- ☆ Strategic, proactive, creative, innovative and collaborative



PROGRAMMING & DATABASE

- ☆ Computer science fundamentals
- ☆ Scripting language e.g. Python
- ☆ Statistical computing package e.g. R
- ☆ Databases SQL and NoSQL
- ☆ Relational algebra
- ☆ Parallel databases and parallel query processing
- ☆ MapReduce concepts
- ☆ Hadoop and Hive/Pig
- ☆ Custom reducers
- ☆ Experience with xaaS like AWS

COMMUNICATION & VISUALIZATION

- ☆ Able to engage with senior management
- ☆ Story telling skills
- ☆ Translate data-driven insights into decisions and actions
- ☆ Visual art design
- ☆ R packages like ggplot or lattice
- ☆ Knowledge of any of visualization tools e.g. Flare, D3.js, Tableau



Guiding Vision

○ Goals

- Build upon history of interdisciplinary research and liberal arts at UO
- Advance new research and educational opportunities
- Mitigate historical weaknesses in methodologies of data science

○ Principles

- Data science covers all areas of the university and society
- Our initiative should therefore be large enough to grow
 - Interdisciplinary research efforts
 - Educational opportunities for existing and new students
 - Collaborative efforts with academic institutions and industry
 - Positive impacts on society

○ Values

- Expansive – include research and educational opportunities
- Inclusive - should not be sequestered in one school or college
- Collaborative - should prosper by growing the size of the overall pie

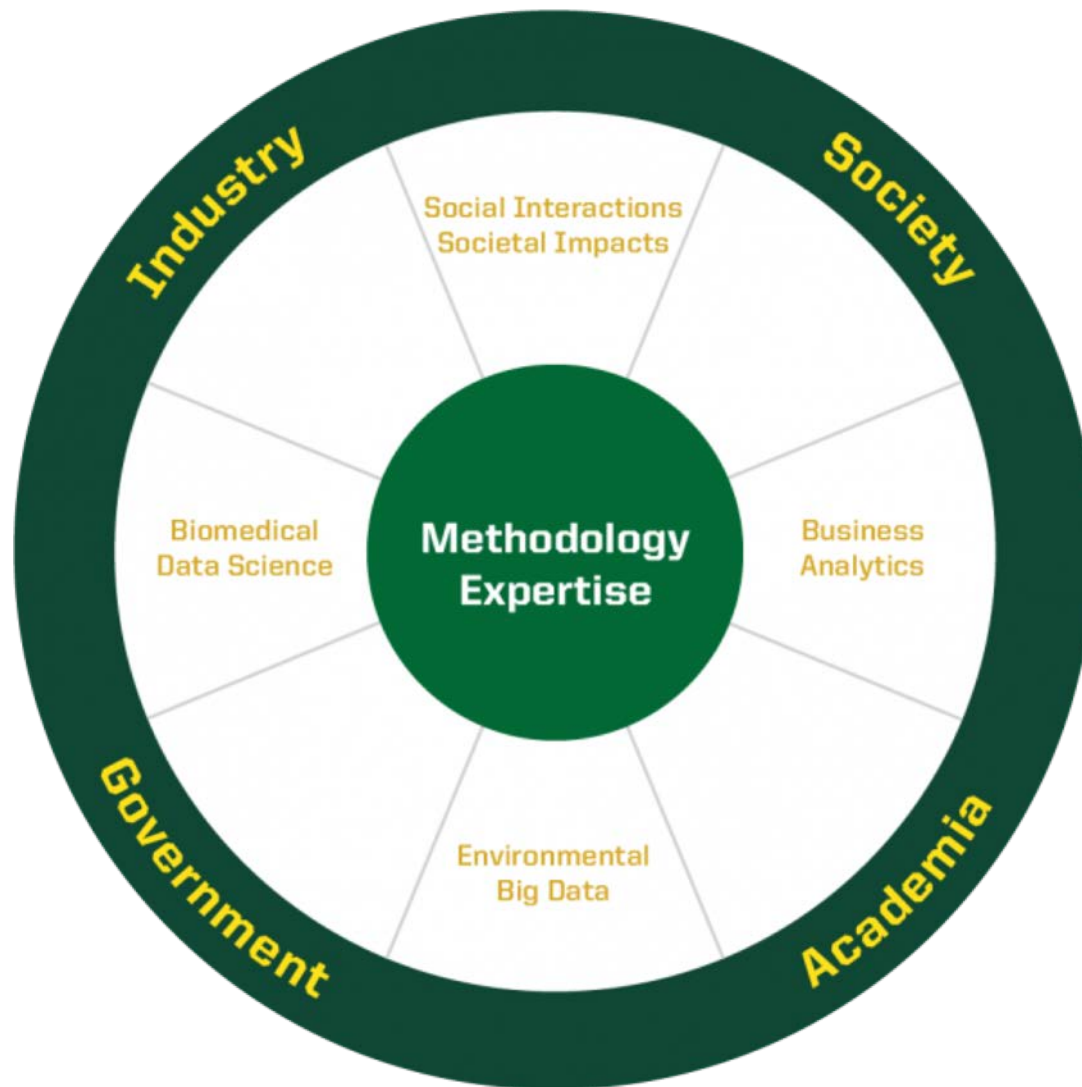


Structural Outline

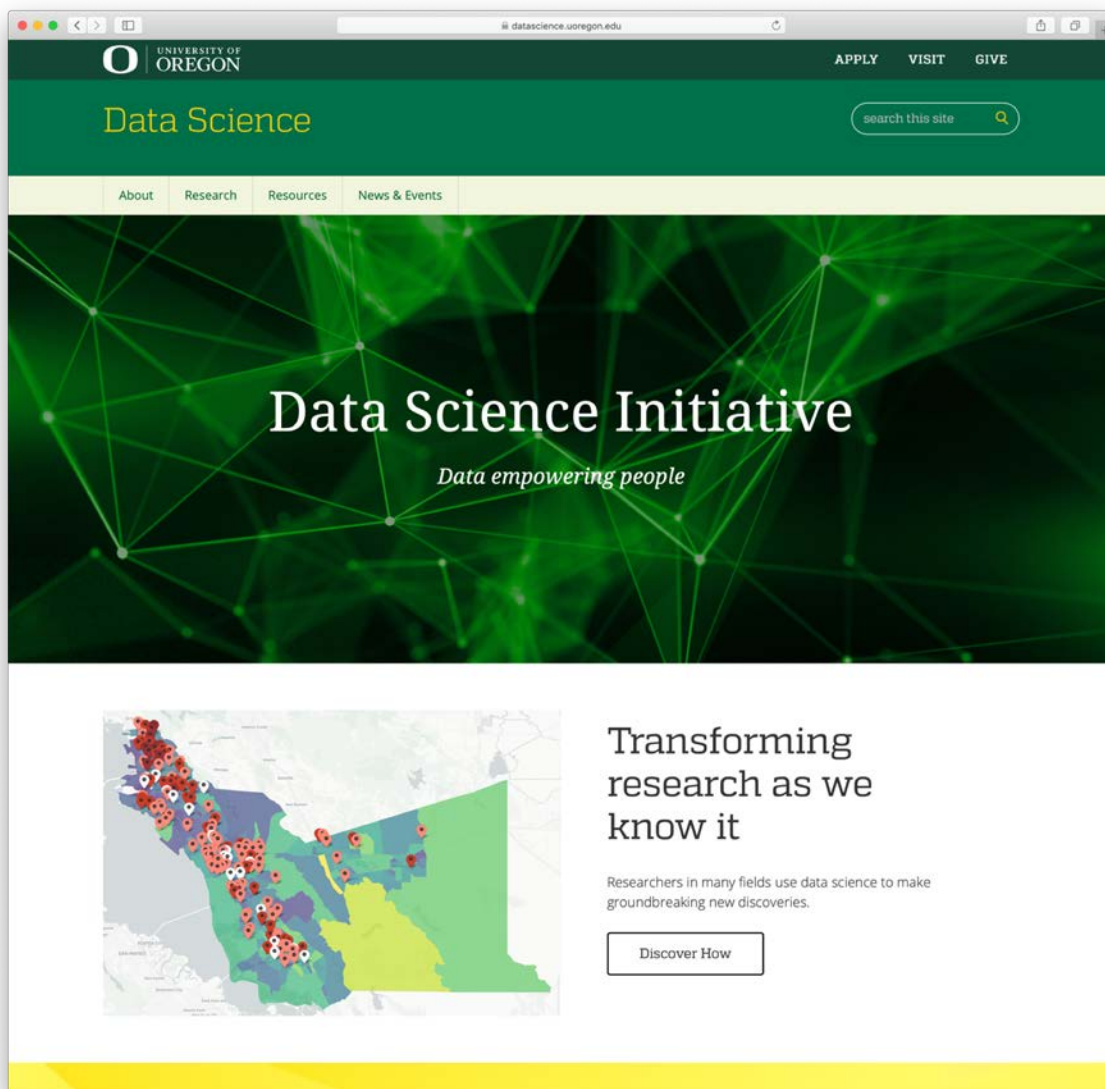
- Acts as a university-wide research institute
 - Support existing and novel research at UO
 - Help develop new research connectivity and impact
- Achieves these goals by building different categories of expertise
 - Domain strengths with data science applications (spokes)
 - Methodological expertise in data science that can pivot (hub)
 - Connectivity and impact (sphere)
- Provides novel graduate and undergraduate education
- Makes stronger connections with sister
 - Sister institutions across Oregon
 - Pacific rim research universities
 - Government, industry and society



Hub and Spoke Model of Data Science @UO



Implementation of the Vision (AY18-20)



- Empower researchers to explore, discover and change the world
- Empower students to achieve successful careers
- Empower our community to take full advantage of the knowledge economy
- Empower our society to continue being a functioning democracy



Activities in AY18/19 – AY19/20

- Build infrastructure and community (Initiative)
 - Build the administrative team
 - Create the cyber and physical spaces for collaboration
 - Informal activities (e.g. machine learning meetups)
 - Seminar series and evening lectures
- Support research foci (Institute)
 - Research infrastructure to support advanced data science
 - Seed grant funding for novel data science research (with OVPRI)
 - Dedicated pre-award help for large data science grants (with OVPRI)
- Design UO-optimal educational activities (Program)
 - Undergraduate data science major
 - Building 'post-graduate' short courses, consulting and support
 - Work with Faculty Senate and Administration to hone and implement
- Strategic plan released to community for feedback



Funding Goals

Aim to position our faculty for success in competing for significant external funding and achieving ambitious educational objectives in the burgeoning field of data science.

- **Convening Grants:** Support the development of research and/or educational activities to further strategic development of the DSI
- **Piloting Grants:** Provide seed funds for faculty to engage in more structured research and scholarship activities to prepare for submission of a highly competitive external grant



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Funding Goals

A list of grant opportunities that largely represent the type of cross-discipline, major institutional awards that align with strategic DSI priorities are available on the [DSI website](#).

Applications for DSI seed funding piloting grants should identify submission of a proposal to one of the flagged opportunities, or similar funding opportunities, as the outcome of their seed funding award.



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Scope of Award & Use of Funds

Convening: \$10,000 and **Piloting:** \$50,000

- 12 month project period beginning January 1, 2020
- Half of awarded funds dispersed at project start; remaining dispersed after 6-month progress report

Allowable Expenses:

- Travel
- Equipment
- Supplies
- Contractual services
- Core/shared facility use*
- Salary support for postdocs, technical personnel, graduate and undergraduate students

Funds may not be used to replace or fund faculty salary, for course buyouts, for construction or facility renovation, or for career development activities

**If proposing to use Talapas or other RACS services, budget for appropriate costs for service use and storage*



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Expectation of Institutional Contribution

The use of awarded funds will be also be predicated upon the willingness of awardees to consider institutional contributions to the growth of Data Science more broadly across campus. Examples of institutional contributions may include:

- Participation in data science activities such as seminar series and machine learning meetups
- Contributing to additional interdisciplinary research projects in data science
- Joint listing of existing courses for broader data science educational activities across campus
- Being involved in discussions for the development of new joint courses in data science

Piloting grants are expected to form proposal development team with DSI and RDS at least 6 months in advance of external proposal submission



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Eligible Applicants

- Faculty from all disciplines
- Tenure-related faculty or career non-tenure track faculty with 0.75 FTE in research professor, research scientist, research engineer, or research associate classification who will hold a UO appointment during the academic year of the research award
- Note: Faculty members may only submit 1 proposal as Principal Investigator, but may serve as a team member on other proposals



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Application Components

1. Application Cover Page
2. Executive Summary (300 words)
3. Proposal Narrative (3 pages)
4. Biographical sketch or CV (5 pages)
5. Current and pending support
6. Budget (Excel template) and budget justification (1 page)



Formatting: Times New Roman 11pt; 1" margins



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Proposal Narrative

A. Concept & Rationale

B. Proposal Plan

C. Future Research and Scholarship

Convening: How does the project align with future research at relevant scales

Piloting: Identify external sponsor agencies and specific funding mechanism and outline proposal development strategy

D. Team Qualifications

E. References (not included in page limit)



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Review Process

- Initial Review: Compliance with guidelines
- Primary Review: Faculty with disciplinary expertise review and make recommendations to Director of DSI
- Feedback will be provided to applicants whose proposals are not funded



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Timeline

Activity	Deadline
RFA Released	May 21, 2019
Application Deadline (5pm)	October 15, 2019
Funding Decisions	December 2019
Anticipated Project Start Date	January 1, 2020
Progress Report	June 30, 2020
Anticipated Project End Date	December 31, 2020
Final Report Submission	January 31, 2021



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Questions?

- **Deadline:** 5pm, Tuesday, October 15, 2019
- Review committee consists of faculty across disciplines; write for a sophisticated, scholarly audience, but not your disciplinary peers
- Develop strong argument for your project and its alignment with DSI priorities and strategic growth
- Reach out to RDS (rds@uoregon.edu) with questions



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