

UC San Diego

SCHOOL OF MEDICINE

Department of BioMedical Informatics

Marehan Waly & Andrew Shen

Dr. Ohno-Machado, Kai Post, Paulina Paul



Full Stack Web Development and Database Design



About Me

- Upcoming 4th year Computer Science Bioinformatics Major at UCSD
- Interested in pursuing an MD/PhD
- Basic experience in Python, Java and HTML (Hypertext Markup Language)





About Me

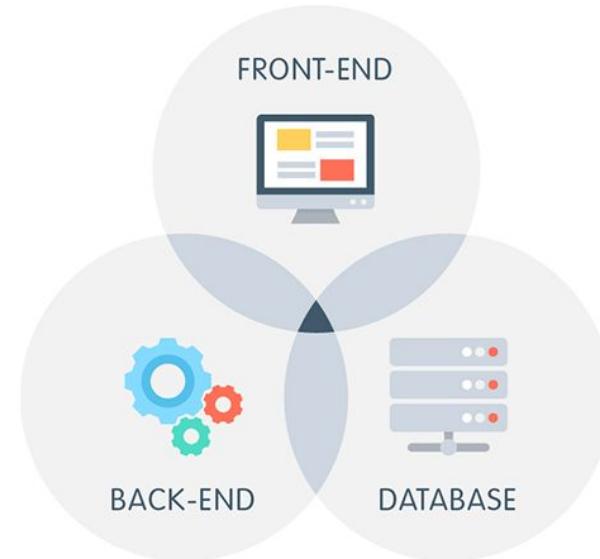
- Upcoming 2nd Year Data Science Major at UCSD
- Interested in the practical use of data and web design and development
- Experience in Python





Outline

- The Problem
- The Benefits of Our Implementation
- The Interface
- The Database
- Future Plans
- What We Learned



National Institutes of Health
Research Training and Career Development



Informatics Research

- Informatics research often includes development of new tools
- To propose a new tool we have to understand:
 - Why it's needed
 - What is already out there
 - Development timeline
 - Required technology and costs
 - Domain and technical expertise
 - How to work with a team





What is the Problem?

- National Institute of Health (NIH) Training Grant Applications are:
 - *extremely long, tedious, and often frustrating*
- 8 data tables
- The information is scattered everywhere!
- 4 months to a year





Training Grant Applications

- Total application is ~ 700 pages
- **8 Tables** account for roughly **300** of those pages
- Other pages: Biosketches and text

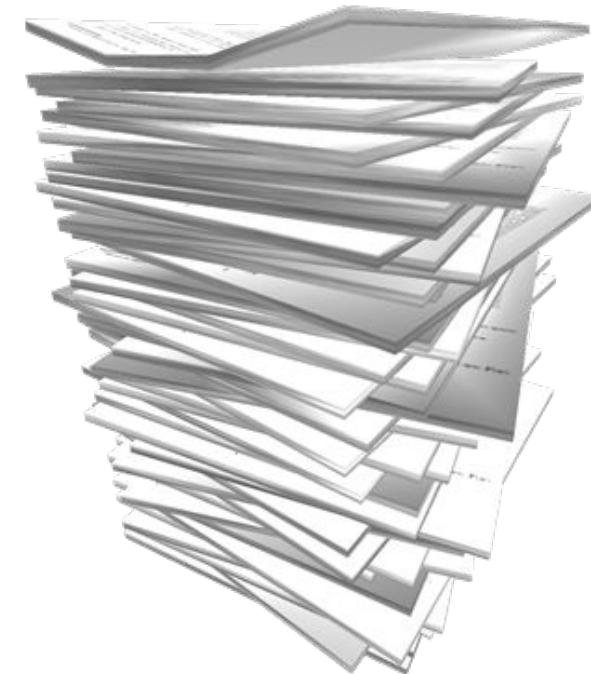




Table 1- Department Information

Part I. Predoctorates

Participating Department or Program	Total Faculty	Participating Faculty	Total Predoctorates	Total Predoctorates Supported by any HHS Training Award	Total Predoctorates with Participating Faculty	Eligible Predoctorates with Participating Faculty	TGE Predoctorates Supported by this Training Grant (Renewals/Revisions)	Predoctorates Supported by this Training Grant (R90 Only Renewals/Revisions)
Department of Biochemistry	45	14	38	15	12	6	2	0
Neuroscience Program	32	20	31	20	14	7	4	1
Department of Pharmacology	25	5	30	10	5	3	3	0
Total	102	39	99	45	31	16	9	1

Part II. Postdoctorates

Participating Department or Program	Total Faculty	Participating Faculty	Total Postdoctorates	Total Postdoctorates Supported by any HHS Training Award	Total Postdoctorates with Participating Faculty	Eligible Postdoctorates with Participating Faculty	TGE Postdoctorates Supported by this Training Grant (Renewals/Revisions)	Postdoctorates Supported by this Training Grant (R90 Only Renewals/Revisions)
Department of Biochemistry	45	14	24	10	9	5	2	0
Neuroscience Program	32	20	27	20	12	5	3	1
Department of Pharmacology	25	5	15	8	5	3	2	0
Total	102	39	66	38	26	13	7	1



Table 2- Faculty Information

Sample Table 2. Participating Faculty Members

Name	Degree(s)	Rank	Primary Department or Program	Research Interest	Training Role	Pre-doctorates In Training	Pre-doctorates Graduated	Predoctorates Continued in Research or Related Careers	Post-doctorates In Training	Post-doctorates Completed Training	Postdoctorates Continued in Research or Related Careers
Abrams-Johnson, Jane	PhD	Asst. Prof.	Pharmacology	Regulation of Synthesis of Biogenic Amines	Preceptor Other Comm	1	2	2	1	0	0
Jones, Lisa S.	PhD	Res. Asst. Prof.	Biochemistry	Protein Structure, Folding, and Immunogenicity	Preceptor Exec Comm	3	3	3	4	2	2
Sandoz, Miguel J.	MD, PhD	Assoc. Prof.	Neuroscience	Developmental Genetics in Drosophila	Preceptor	4	6	5	4	8	6
Thomas, James C.	PhD	Prof.	Biochemistry	Molecular and Genetic Analysis of RNA Viruses	PD/PI	7	10	9	8	15	14



Table 3 - Department Grants

Sample Table 3. Federal Institutional Research Training Grants and Related Support Available to Participating Faculty Members								
Grant Title	Award Number	Project Period	PD/PI	Number of Predoctoral Positions	Number of Postdoctoral Positions	Number of Short-Term Positions	Number of Participating Faculty (Number Overlapping)	Names of Overlapping Faculty
Bioimmunotherapy Training Grant	T32 CA05964-11	07/2011-06/2016	Thomas, James C.	12	0	0	25 (6)	Abelson Brown Fields Johnson Sung Watson
Genetic Basis of Mental Illness	T32 MH02708-07	07/2010-06/2015	Johnson, Albert P.	4	4	2	7 (2)	Johnson Watson
Research Education Program for Residents in Psychiatry	R25 MH09876-06	07/2013-06/2018	Mendez, V. Roberto	0	6	0	33 (3)	Mendez Rivers Truesdale
Career Development in Pediatric Mental Health	K12 HD01234-09	07/2012-06/2017	Sterman, Patricia S.	0	4	0	19 (1)	Rubin
Total				16	14	2		



Table 4 - Faculty Research Support

Sample Table 4. Research Support of Participating Faculty Members

Faculty Member	Funding Source	Grant Number	Role on Project	Grant Title	Project Period	Current Year Direct Costs
Jones, Janine L.	NIH	1 R01 GM76259-01	PD/PI	Structure and Function of Acetylcholine Receptors	06/2014-05/2018	\$190,000
Jones, Janine L.	NIH	5 K08 AI00091-03	PD/PI	Purification & Identification of Receptors	11/2012-11/2017	\$140,000
Ehlers, Roger G.	Univ		PD/PI	University start-up funds	08/2014-07/2017	\$350,000
Mack, Thomas R.	Fdn		PD/PI	Control of Angiogenesis	03/2011-02/2015	\$185,000
Mack, Thomas R.	NSF	PCM 80-12935	PD/PI	Cell Culture Center	12/2012-11/2015	\$180,000
Mack, Thomas R.	NIH	1 P01 HL71802-05	Project PI	Subproject 4: Oncogenic Kit Receptor Signaling <i>in vivo</i>	10/2011-09/2015	\$165,000
Smith, James P.	None					
Zachary, Andrew	NIH	1 U01 AI28507-02	PD/PI	Human Monoclonal Antibodies as a Therapy for Staphylococcal Enterotoxin	07/2013-06/2018	\$200,000
Average Grant Support per Participating Faculty Member						\$282,000



Table 5 - Trainee Publications

Sample Table 5A. Publications of Those in Training: Predoctoral

Faculty Member	Trainee Name	Past or Current Trainee	Training Period	Publication (Authors, Year, Title, Journal, Volume, Inclusive Pages)
Berg, Lawrence P.	Thompson, Patricia P.	Past	1998-2004	Miter, M.H., Owens, R., Thompson, P. , and Berg, L., 2004, Insulin Treatment of Diabetic Rats, <i>J Comp Neurol</i> , 373:350-378.
Chu, Jeremy K.	Greenstein, Michael L.	Past	2008-2014	Greenstein, M. , and Chu, J., 2010, Sympathetic Noradrenergic Innervation of Drosophila, <i>Genetics</i> 185: 1100-1190.
Chu, Jeremy K.	Brown, Bernice B.	Current	2010-Present	Brown, B. and Chu, J., 2012, Repeated Sequences in Drosophila, <i>J Mol Biol</i> , 242:503-510.
Layback, Sally G.	Wand, Dennis R.	Past	2000-2001	No Publications: Left program
Neustaff, Lorena B.	Smith, Benjamin L.	Current	2011-Present	Smith, B. and Neustaff, 2014, Preliminary x-ray crystal structure of beta-adrenergic receptor. <i>Biophysical J.</i> , Abstract.
Peters, Mark Q.	Samuels, Janine A.	Current	2010-Present	Samuels, J. and Peters M., 2012, Molecular Analysis of RNA Viruses, <i>Molec Biol Cell</i> , 11:12-18.



Table 6 - Applicants Info

Previous Year: 2011-2012	Total Applicant Pool	Applicants Eligible for Support	New Entrants to the Program	New Entrants Eligible for Support	New Entrants Appointed to this Grant (Renewal/Revision Applications Only)
Department of Biochemistry	65	40	10	5	6
Department of Molecular & Cell Biology	35	20	7	4	4
Program in Systems Biology	10	8	6	5	2
Total	110	68	23	14	12

Previous Year: 2010-2011	Total Applicant Pool	Applicants Eligible for Support	New Entrants to the Program	New Entrants Eligible for Support	New Entrants Appointed to this Grant (Renewal/Revision Applications Only)
Department of Biochemistry	52	30	7	7	5
Department of Molecular & Cell Biology	35	21	9	4	3
Program in Systems Biology	12	10	5	5	3
Total	99	61	21	16	11

Previous Year: 2009-2010	Total Applicant Pool	Applicants Eligible for Support	New Entrants to the Program	New Entrants Eligible for Support	New Entrants Appointed to this Grant (Renewal/Revision Applications Only)
Department of Biochemistry	40	23	4	3	2
Department of Molecular & Cell Biology	30	18	6	4	3
Program in Systems Biology	12	10	5	4	3
Total	82	51	15	11	8

Table 7 - Appointments

Training Positions	Budget Year 01	Budget Year 02	Budget Year 03	Budget Year 04	Sum of Budget Years
Predoctoral Awarded	8	8	8	8	32
Predoctoral Appointed	8	8	8	8	32
Predoc: Dual-Degree	0	0	1	1	2
Predoc: Diverse Backgrounds	0	5	2	2	9
Postdoctoral Awarded	4	4	4	4	16
Postdoctoral Appointed	4	4	4	4	16
Postdoc: MD or Equivalent	0	1	0	1	2
Postdoc: PhD or Equivalent	3	1	3	3	10
Postdoc: DDS, DVM, Other	1	1	0	0	2
Postdoc: Dual Degree	0	1	1	0	2
Postdoc: Diverse Backgrounds	0	0	0	0	0
Short-Term Awarded	8	8	6	7	29
Short-Term Appointed	7	6	6	7	26
Short-Term: Diverse Backgrounds	2	2	1	2	7



Table 8 - Trainee Information

Part II. Those Clearly Associated with the Training Grant

Trainee	Faculty Member	Start Date	Summary of Support During Training	Terminal Degree(s) Received and Year(s)	Topic of Research Project	Initial Position Department Institution Activity	Current Position Department Institution Activity	Subsequent Grant(s)/Role/Year Awarded
Robinson, Brian	Smith, Jerry	09/2010	TY 1: Univ S TY 2: CA R01 TY 3: CA R01 TY 4: Fdn F	In Training	Reconstitution of Tumor suppressor function			
O'Leary, Ann L.	Coates, Robert	09/2008	TY 1: GM T32 TY 2: GM T32 TY 3: CA T32 TY 4: CA F31 TY 5: CA F31	PhD 2013	Genetic Cancer Biomarkers	Postdoctoral Fellow Molecular Biology UCLA Research-Intensive		

Part III. Recent Graduates (Only for New Applications and for Postdoctoral Renewal/Revision Applications Requesting an Expansion for Predoctoral support)

Trainee	Faculty Member	Start Date	Summary of Support During Training	Terminal Degree(s) Received and Year(s)	Topic of Research Project	Initial Position Department Institution Activity	Current Position Department Institution Activity	Subsequent Grant(s)/Role/Year Awarded
Moore, Thomas P.	Trimmer, Sean R.	09/2007		PhD 2013	Src Kinase and Breast Cancer	Postdoctoral Fellow Medicine Boston University Further Training	Postdoctoral Fellow Medicine Boston University Further Training	
Rosenthal, Julia R.	Coates, Robert	09/2009		PhD 2014	Modulation of host cellular responses	Medical Student Medicine Northwestern University Further Training	Medical Student Medicine Northwestern University Further Training	

Part IV. Program Statistics

Percentage of Trainees Entering Graduate School 10 Years Ago Who Completed the PhD	Average Time to PhD for Trainees in the Last 10 Years
50.2%	6.5 years



List of Data Sources

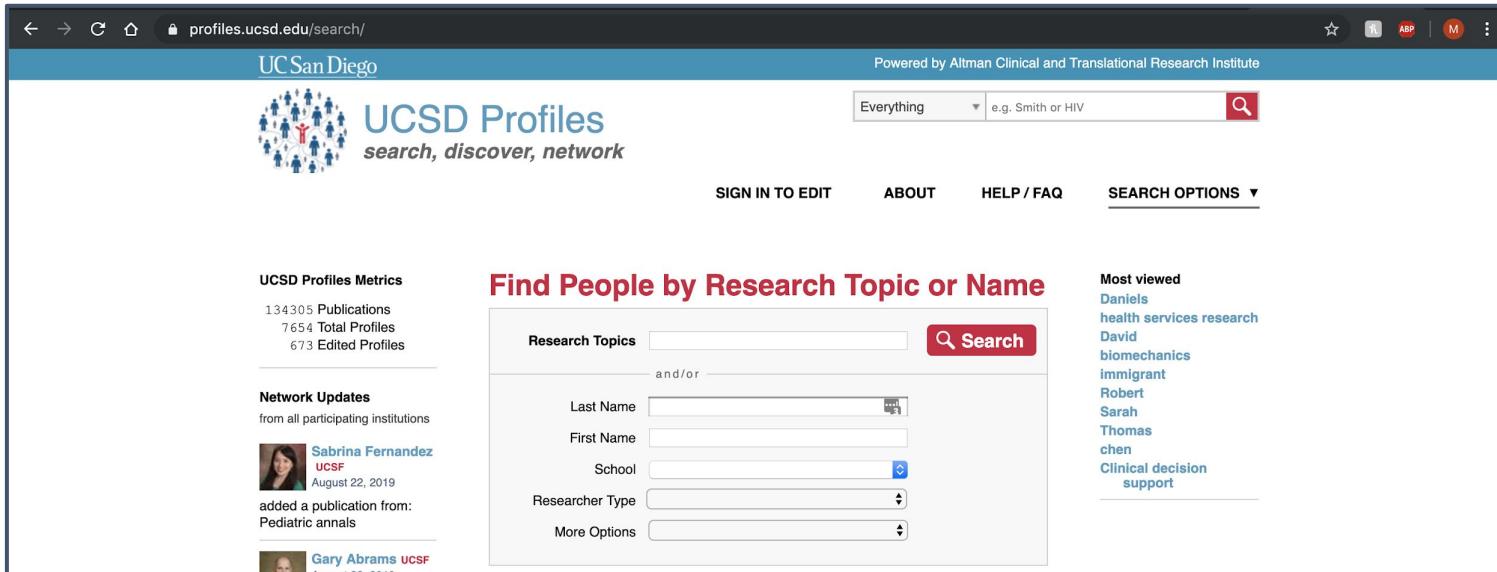
1. Manual Input
2. Academic File
3. Grad Division
4. Research Scholars Appointment System (RSAS)
5. Payroll Personnel System (PPS)
6. NIH (National Institute of Health) Reporter
7. Employeeelink
8. Office of Post Award Financial Services (OPAFS)
9. National Center for Biotechnology Information (NCBI)
10. Blink
11. OPAFS Lookup Tool
12. Alumni Association
13. Grad Division/Institutional Research (Alfredo)
14. Coeus
15. Faculty Academic File

Table	Table Name	Part	Part Detail	Data Needed	Data Source
1	Census of Participating Departments and Inter/Departmental Programs	I	Predoctorates	Participating Department or program Total Faculty Participating Faculty	Blink or PPS Blink or Employeeelink Employeeelink Grad division/Institutional Research (Alfredo) Grad division
			Predoctorates	Total Predoctorates Total Predoctorates supported by any HHS Award	Grad division
		II	Predoctorates	Total Predoctorates with Participating Faculty Eligible Predoctorates with Participating Faculty Training Grant Eligible (TGE) Predoctorates supported by this Training Grant (Renewals, Revisions only)	PPS
			Predoctorates	Predoctorates supported by this Training Grant (R90 Only Renewals/Revisions)	Blink or PPS
			Predoctorates	Participating Department or program Total Faculty Participating Faculty	Blink or PPS Employeeelink
	II	Postdoctorates	Predoctorates	Total Postdoctorates Total Postdoctorates supported by any HHS Award	RSAS RSAS
			Postdoctorates	Total Postdoctorates with Participating Faculty Eligible Postdoctorates with Participating Faculty Training Grant Eligible (TGE) Postdoctorates supported by this Training Grant (Renewals, Revisions only)	RSAS
			Postdoctorates	Postdoctorates supported by this Training Grant (R90 Only Renewals/Revisions)	PPS or RSAS
			Postdoctorates	Name Degree(s) Rank Primary Department or Program	Blink or PPS
			Postdoctorates	Research Interest Training Role Predoctorates in Training Predoctorates Graduated	PPS Blink or PPS Manual or Academic File Manual Academic File Academic File
2	Participating Faculty Members	I	Faculty Member	Predoctorates Continued in Research or Related Careers	Academic File Academic File Academic File Academic File
			Mentoring Record	Postdoctorates in Training Postdoctorates Completed Training Postdoctorates Continued in Research or Related Careers	Academic File Academic File Academic File
	III	Mentoring Record	Mentoring Record	Grant Title Award Number Project Period PD/PI	Coeus OPAFS or NIH Reporter OPAFS or NIH Reporter OPAFS or NIH Reporter
			Mentoring Record	Number of Predoctoral Positions	Manual or NIH Reporter
3	Federal Institutional Research Training Grants and related Support Available to Recreational Faculty				



Data Sources - Solutions

- Use of UCSD Profiles API (Application Program Interface)
- Current Excel Files Collected by UCSD's Training Grant Analyst



The screenshot shows the UCSD Profiles search interface. At the top, there is a navigation bar with links for 'SIGN IN TO EDIT', 'ABOUT', 'HELP / FAQ', and 'SEARCH OPTIONS'. Below the navigation bar, there is a search bar with the placeholder 'e.g. Smith or HIV' and a search button. To the left of the search bar, there is a sidebar with 'UCSD Profiles Metrics' (134305 Publications, 7654 Total Profiles, 673 Edited Profiles) and 'Network Updates' from all participating institutions. One update is shown for Sabrina Fernandez, UCSF, added a publication from: Pediatric annals on August 22, 2019. Another update is shown for Gary Abrams, UCSF, added a publication from: Pediatric annals on August 22, 2019. On the right side, there is a 'Most viewed' section with a list of names and topics: Daniels, health services research; David, biomechanics; immigrant; Robert; Sarah; Thomas; chen; Clinical decision support.



Importance and Benefits

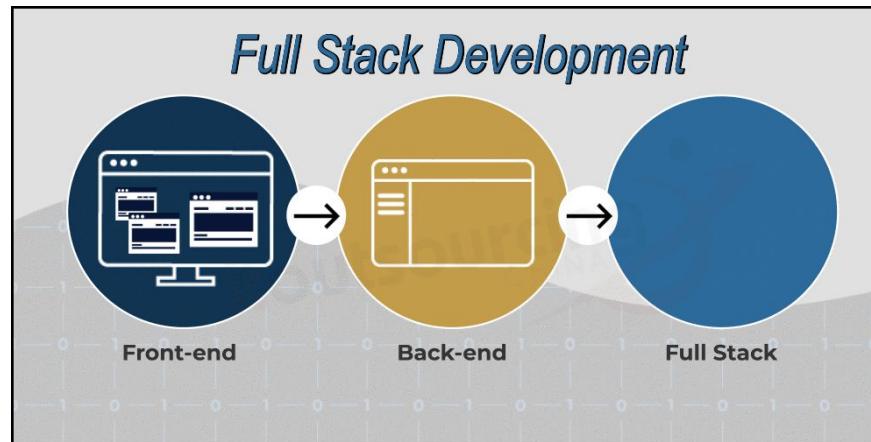


<https://pulse.ucsd.edu/departments/research-service-core/training-grants/reports-data/Pages/default.aspx>



Our Solution

- A full stack web application demo with a user friendly interface, and a relational database that can auto populate as much information needed for the 8 data tables
- Other universities have variations of this solution such as UCSF





The Interface - Roles

A screenshot of a web browser displaying the "UCSD Grant Applications Home Page". The URL in the address bar is "localhost:5000/Home". The page has a dark header with the UCSD logo and the text "UCSanDiego". Below the header is a navigation bar with links: "Home", "Training Grant Administration", "Department Administration", "Program Director", "Faculty", and "Trainee". Five purple arrows point upwards from the center of each of these six links towards the top of the slide, indicating their relationship to the "Roles" mentioned in the title. The main content area contains sections for "About The Site", "About Us", and "Acknowledgements", each with descriptive text and a bulleted list of names.

UCSD Grant Applications Home Page

About The Site:
This is the home page of our Training Grant Application Interface! This interface is meant to greatly simplify the very time-consuming process required to apply for and renew training grants at UCSD. This interface allows:

- UCSD Training Grant Admins to Access/Edit the tables in the database
- Department Admins to add information into the database
- Program Directors to access/edit their current training grants for renewal
- Faculty members to add their information into the database

About Us:
This website was created by Marehan Waly and Andrew Shen during the DBMI 2019 Summer Internship. We are two undergraduates at UCSD :)

Acknowledgements:

- Dr. Lucila Ohno-Machado
- Kai Post
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Training Grant Admin

localhost:5000/Home

UCSanDiego

Home Training Grant Administration Department Administration Program Director Faculty Trainee

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- Anirvan Chatterjee

This research was supported by grant T15LM011271



Department Admin

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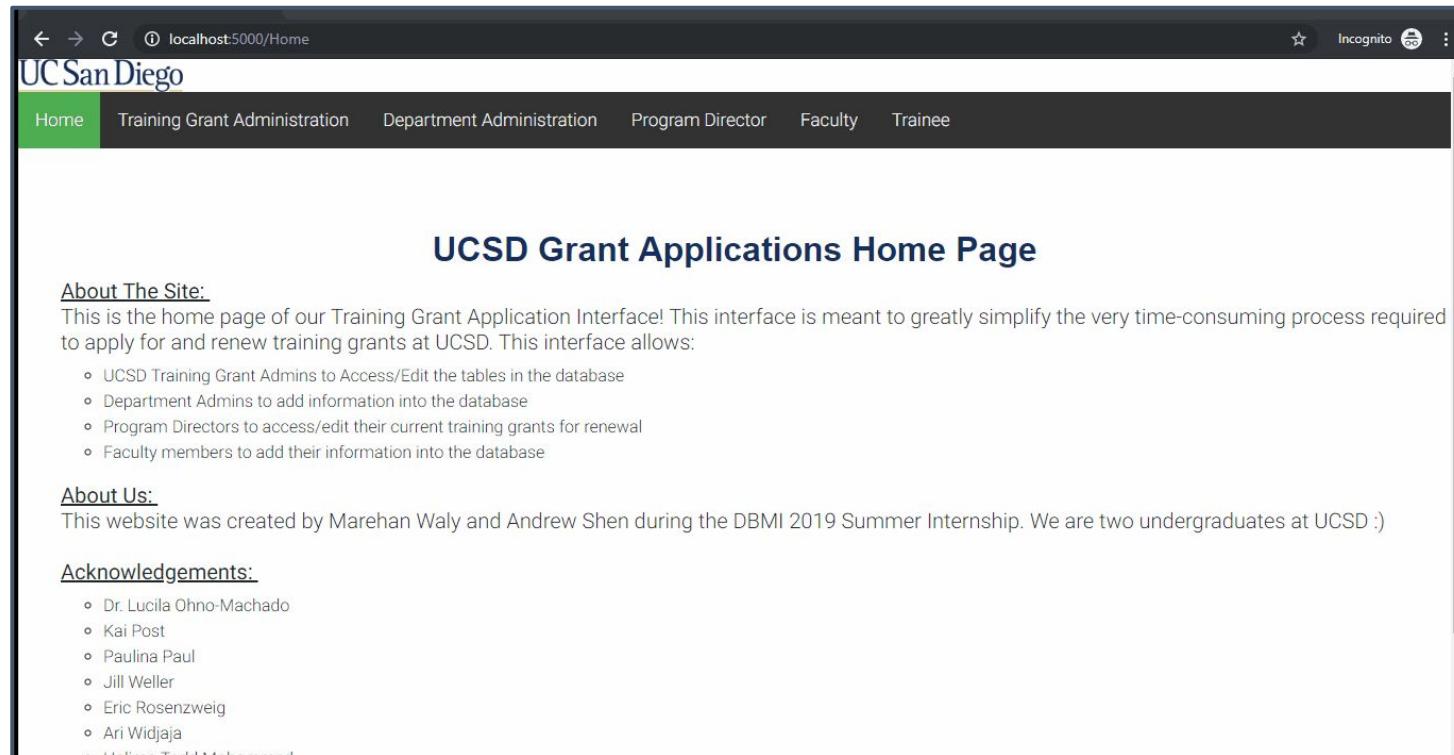
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Program Director



A screenshot of a web browser displaying the "UCSD Grant Applications Home Page". The browser's address bar shows "localhost:5000/Home". The page has a dark header with the "UCSanDiego" logo and a navigation menu containing "Home" (highlighted in green), "Training Grant Administration", "Department Administration", "Program Director", "Faculty", and "Trainee". The main content area features a large title "UCSD Grant Applications Home Page" and three sections: "About The Site", "About Us", and "Acknowledgements".

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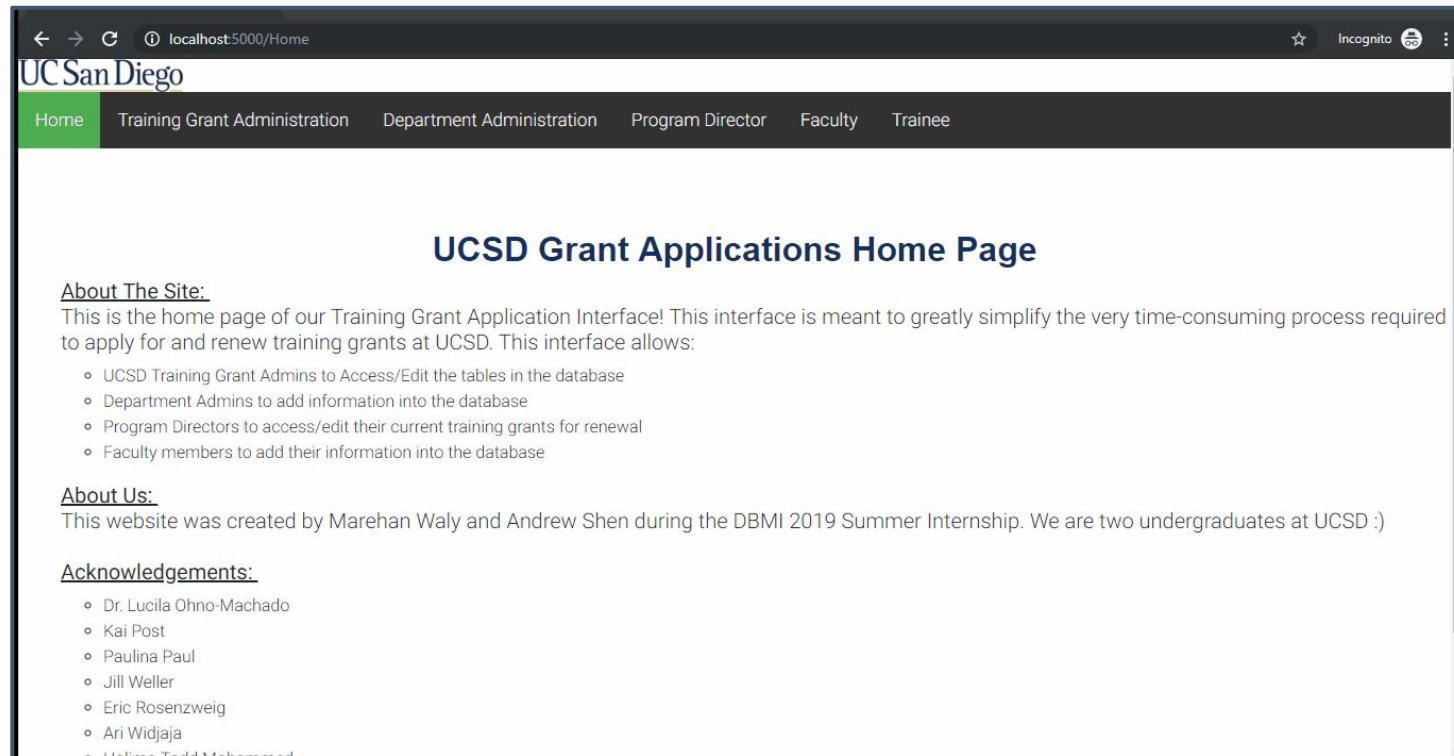
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Faculty

localhost:5000/Home

UCSanDiego

Home Training Grant Administration Department Administration Program Director Faculty Trainee

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Trainee

localhost:5000/search

Search Student



Our Application

Full Stack Web Application using:

SQL Database on
Amazon Web Services



Python Web
Framework



HTML, CSS, and
Javascript interfaces



crunchify.com



Full Stack Development

HTML Interface/Website



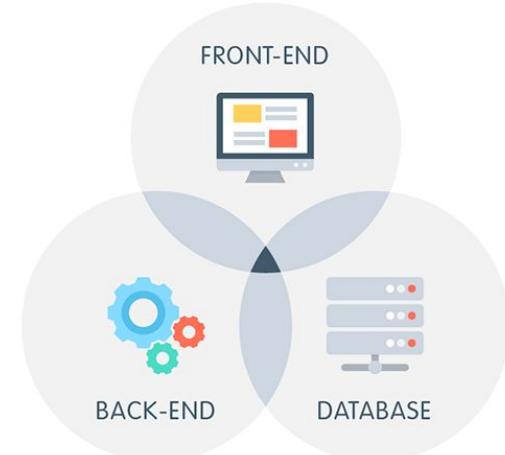
CSS + Javascript Server and Client Interaction



Python Web Framework

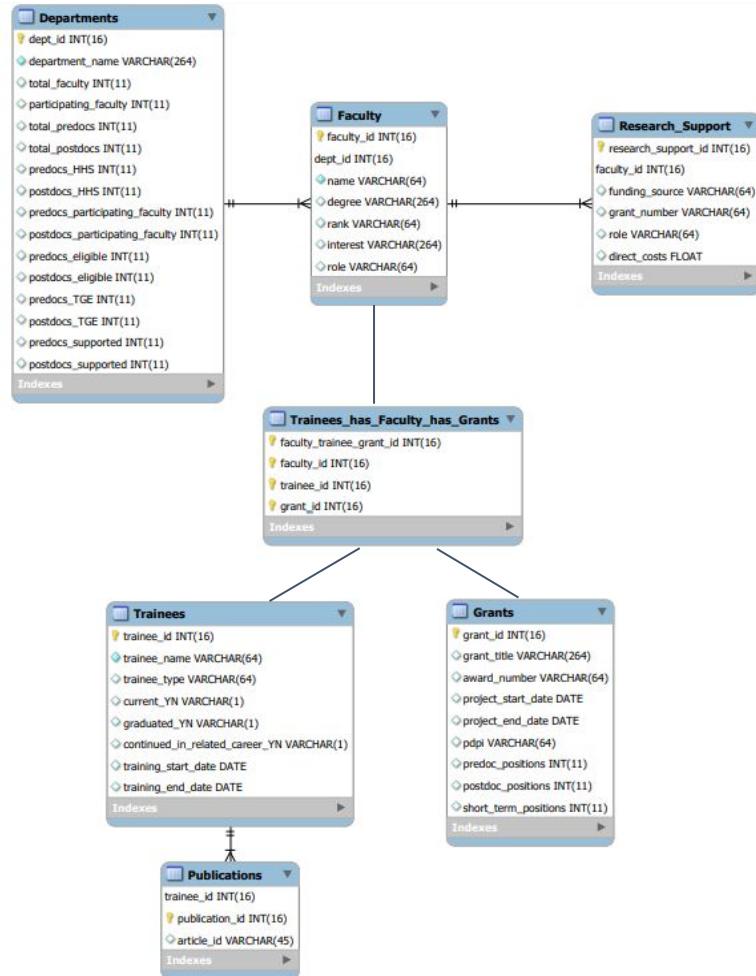


SQL Database





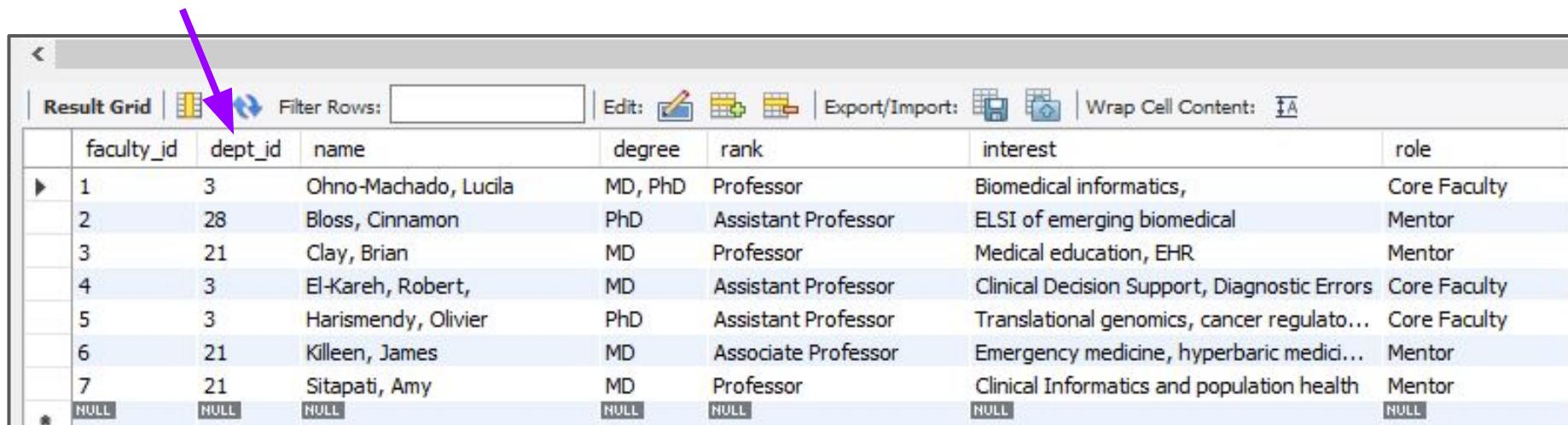
- Data normalization to remove redundancy and breaks tables down into smaller sections
- Self updating when any information is entered





Data Storage and Access

- Easy to access for programs but not for people
- Organized format however can be difficult for humans to read



Result Grid							
	faculty_id	dept_id	name	degree	rank	interest	role
▶	1	3	Ohno-Machado, Lucila	MD, PhD	Professor	Biomedical informatics,	Core Faculty
	2	28	Bloss, Cinnamon	PhD	Assistant Professor	ELSI of emerging biomedical	Mentor
	3	21	Clay, Brian	MD	Professor	Medical education, EHR	Mentor
	4	3	El-Kareh, Robert,	MD	Assistant Professor	Clinical Decision Support, Diagnostic Errors	Core Faculty
	5	3	Harismendy, Olivier	PhD	Assistant Professor	Translational genomics, cancer regulato...	Core Faculty
	6	21	Killeen, James	MD	Associate Professor	Emergency medicine, hyperbaric medici...	Mentor
	7	21	Sitapati, Amy	MD	Professor	Clinical Informatics and population health	Mentor
*	HULL	HULL	HULL	HULL	HULL	HULL	HULL



- Converts Database into understandable format
- Contains the framework and map for the website
- API Access for UCSD Profiles and Pubmed

```
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  </url>
```



UCSD Profiles API

Jejo Koola



Title(s) Assistant Clinical Professor, Medicine
School Health Sciences
Phone 858-246-2563
Email jkoola@ucsd.edu
[vCard](#) [Download vCard](#)

[Education and Training](#) | [Overview](#) | [Interests](#) | [Research Activities and Funding](#) |
[Featured Publications](#) | [Websites](#) | [Faculty Mentoring](#) | [Publications](#) ←

Education and Training

Vanderbilt University, Nashville, TN	MS	12/2018	Biomedical Informatics
Department of Veterans Affairs, Nashville, TN		09/2016	Fellowship in Biomedical Informatics
Medical College of Virginia, Richmond, VA	Medicine	06/2011	Internal Medicine Residency
Medical Univ. of South Carolina, Charleston, SC	MD	05/2008	Medicine
Purdue University, West Lafayette, IN			Biology, Computer Science

Overview

Dr. Jejo Koola joined UCSD faculty in 2016. He received his MD degree from the Medical University of South Carolina and subsequently completed his residency in Internal Medicine at the Medical College of Virginia in Richmond, Virginia in 2011. Following residency, Dr. Koola completed a post-doctoral fellowship in Biomedical Informatics through the Department of Veterans Affairs in conjunction with Vanderbilt University in 2016.

```
{
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    {
      "summary" : "Elected fellow, American Institute for Medical and Biological Engineering"
    },
    {
      "summary" : "Elected member, National Academy of Medicine"
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      "summary" : "Elected member, International Academy of Health Sciences Informatics"
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    },
    {
      "summary" : "Elected member, American Society for Clinical Investigation"
    }
  ],
  "bio" : "Professor of Medicine\nAssociate Dean for Informatics and Technology, UCSD School of Medicine\nChair, Biomedical Informatics Education and Research",
  "departmentPrimary" : "Medicine",
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      "organization" : "Fundacao Getulio Vargas, Escola de Administração"
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      "degree" : "Ph.D.",
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      "degree" : "M.D.",
      "organization" : "University of Sao Paulo"
    }
  ]
}
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1



HTML, CSS, and Javascript

MySQL Workbench

File Edit View Query Database Server Tools Scripting Help

Navigator Faculty Grants Departments Trainees Trainees_has_Faculty_has_Grants Research_Support

Filter objects

mydb

Tables

Departments Faculty Grants Publications Research_Support Trainees Trainees_has_Faculty_has_Grants

No object selected

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Contents: | Result Grid | Form Editor | Field Types | Query Stats | Revert

grants_id grant_title award_number project_start_date project_end_date pdpi predoc_positions postdoc_positions short_term

grants_id	grant_title	award_number	project_start_date	project_end_date	pdpi	predoc_positions	postdoc_positions	short_term
1	THE RESEARCH ETHICS EDUCATION PROGRAM...	SR2STW010026-04	2015-05-01	2020-04-30	AL DELAIMY, Wael K.	0	0	0
2	UCSD INTEGRATED CARDIOVASCULAR EPIDEMI...	ST32HL079891-12	2007-05-01	2022-08-31	Allison, Matthew A.	2	4	0
3	PREDOCTORAL RESEARCH TRAINING IN MATE...	ST39HD064385-07	2010-04-01	2022-04-30	Best, Brooke	0	0	5
4	UCSD CANCER CENTER TRAINING PROGRAM I...	ST32CA121938-14	2006-07-01	2021-06-30	Bouvet, Michael	0	8	0
5	TRAINING IN MOLECULAR AND CELL BIOLOGY ...	ST32AI007469-25	1994-09-30	2019-06-30	BRODIE, DAVID H	15	0	0
6	GRADUATE TRAININGS IN CELLULAR AND MOLE...	ST32GM007752-41	1979-07-01	2024-06-30	BROWN, JOAN HELLER	0	0	0
7	CHEMICAL BIOLOGY INTERFACES AT UC SAN D...	ST32GM112584-04	2015-07-01	2020-06-30	BURKART, MICHAEL D.	4	0	0
8	DEVELOPING PEDIATRIC CLINICAL PHARMACO...	ST32HD087978-03	2016-05-01	2021-04-30	CAPPARELLI, EDMUND VINCENT	0	1	0
9	INTERDISCIPLINARY RESEARCH FELLOWSHIP I...	SR2SM1081482-12	2007-08-15	2022-05-31	Cherner, Mariana	0	4	0
10	TRAINING GRANT IN GASTROENTEROLOGY	ST32DK007202-42A1	1976-07-01	2023-06-30	CROWE, SHELIA E.	2	4	0
70	DBMI SUMMER 2019 TEST GRANT	01	2019-06-17	2019-08-23	OHNO-MACHADO, LUCILA	HULL	HULL	HULL

Grants 1 x

Action Output

#	Time	Action	Message	Duration / Fetch
1	07.05.28	SELECT * FROM mydb.Faculty LIMIT 0, 1000	3 row(s) returned	0.031 sec / 0.000 sec

Object Info Session

Query Completed

This research was supported by grant T15LM011271



HTML, CSS, and Javascript

Admin Table 2

localhost:5000/admin_table2

UCSanDiego

Home Training Grant Administration Department Administration Program Director Faculty Trainee

Table 2 - Faculty Information

Name	Degree(s)	Rank	Primary Department or Program	Research Interest	Training Role	Predoctorates In Training	Predoctorates Graduated	Predoctorates Continued In Research or Related Careers	Postdoctorates In Training	Predoctorates Completed Training	Postdoctorates Continued In Research or Related Careers	
Onno-Machado, Lucila	MD, PhD	Professor	Bioinformatics & Systems Biology	Biomedical informatics,	Core Faculty	2	0	0	0	0	0	<button>REMOVE</button>
Bloss, Cinnamon	PhD	Assistant Professor	Psychiatry	ELSI of emerging biomedical	Mentor	0	0	0	0	0	0	<button>REMOVE</button>
Clay, Brian	MD	Professor	Medicine	Medical education, EHR	Mentor	0	0	0	0	0	0	<button>REMOVE</button>
El-Kareh, Robert,	MD	Assistant Professor	Bioinformatics & Systems Biology	Clinical Decision Support, Diagnostic Errors	Core Faculty	0	0	0	0	0	0	<button>REMOVE</button>
Harismendy, Olivier	PhD	Assistant Professor	Bioinformatics & Systems Biology	Translational genomics, cancer regulatory genetic variation	Core Faculty	0	0	0	0	0	0	<button>REMOVE</button>
Killeen, James	MD	Associate Professor	Medicine	Emergency medicine, hyperbaric medicine and wound care	Mentor	0	0	0	0	0	0	<button>REMOVE</button>



HTML, CSS, and Javascript

S localhost:5000/input_form_faculty X +

localhost:5000/input_form_faculty

Home Training Grant Administration Department Administration Program Director Faculty Trainee

UCSD Grant Applications Faculty Page

Faculty Input Form for Ohno-Machado, Lucila

Name
Ohno-Machado, Lucila

MD, PhD ▾

Professor ▾

Bioinformatics & Systems Biology ▾

Research Interest
Biomedical informatics,

Training Role
Core Faculty

SUBMIT

List of Existing Trainees

Marchan Waly
 Andrew Shen

Select

Add New Trainee

Current Research Support

Documentation



Space Directory

[Create Space](#)

Space	Description	Categories
Blockchain Competition		
CAPMC		
DBMI		
DBMI IT Documentation		documentation
DBMI - MD Project Space	Space for DBMI team ONLY to utilize for anything related to MD projects. Internal Meeting notes, articles, etc.	knowledge-bases
DBMI Service Desk		knowledge-bases
iCONCUR		software-project
KC6-1 Evaluation of Midpoint Identity Management		documentation
KC6-2 Blockchain Distributed Ledger		documentation
NIH Data Commons		teams
OHDSI		
SHINE-L	Project documentation for SHINE-L and associated software/technology	software-project



Future Plans

- Get all 8 Tables functioning on the site
- Ability to save drafts and edits for later use
- Database cleaning, restrictions, and security
- Faculty Sign-in Page and auto redirection to subpages
- Ability to email notifications to faculty and trainees



What We Learned

Programming

- Python (Flask, APIs)
- HTML, Javascript, and CSS

Database

- Relational Database Design
- SQL and MySQL Workbench

Logistics

- Front end Design
- Amazon Web Services
- Documentation

Acknowledgements

- Dr. Lucila Ohno-Machado
- Kai Post
- Paulina Paul
- Jill Weller
- Eric Rosenzweig
- Ari Widjaja
- Dr. Jejo Koola
- Dr Tsung-Ting Kuo
- Elizabeth Santillanez
- Nancy Herbst



Questions?