"What is the proportion of bachelor's degrees earned by women in the College of Engineering?"

- Raw Data from CalAnswers (https://rtang18.github.io/engineering/engineering.csv)
- Data Cleaning Notebook (https://github.com/rtang18/WITI-RT/blob/master/engineering/engineering%20degrees%20by%20gender.ipynb)

Below are the College of Engineering degrees by Gender in counts and percentages. We can see that the four largest majors in the CoE are Bioengineering, Civil Engineering, Electrical Engineering & Computer Science, and Mechanical Engineering.

In [1]:
```
from IPython.display import IFrame
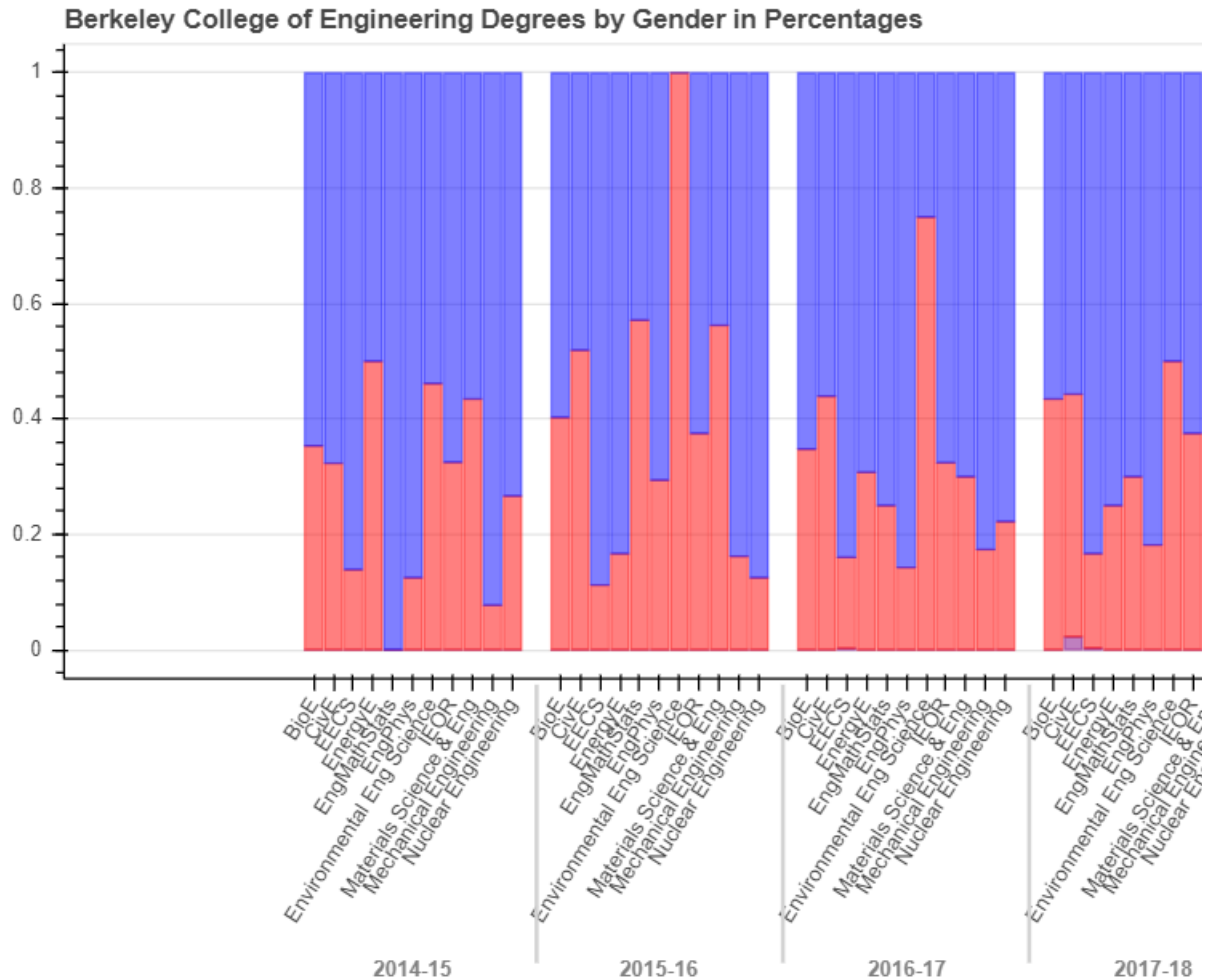```

In [2]: `IFrame('coe_18.html', width=800, height=600)`

Out[2]:
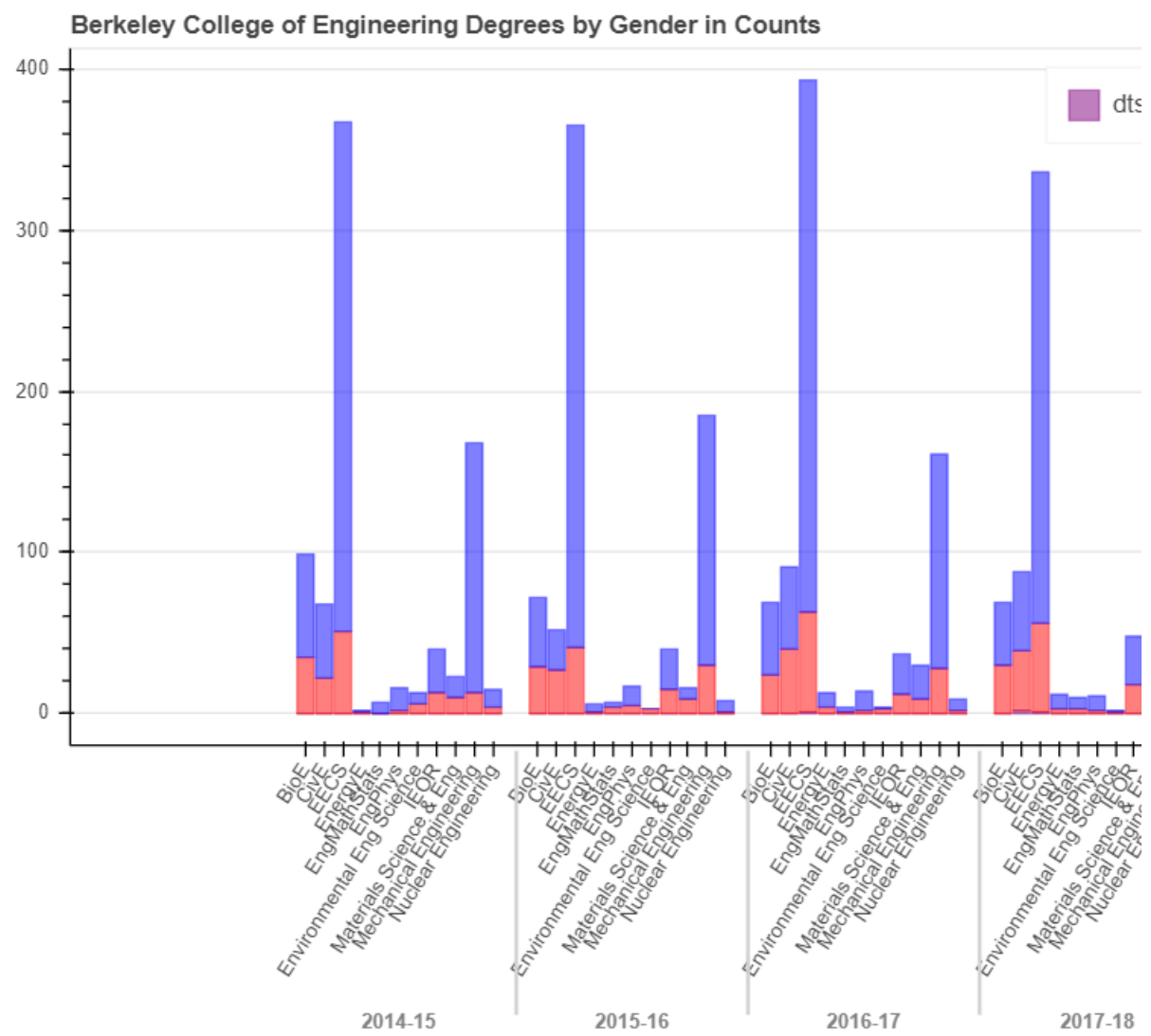
```
In [3]:  IFrame(src='coe_18_percentages.html', width=800, height=525)
```

Out[3]:

Berkeley College of Engineering Degrees by Gender in Percentages

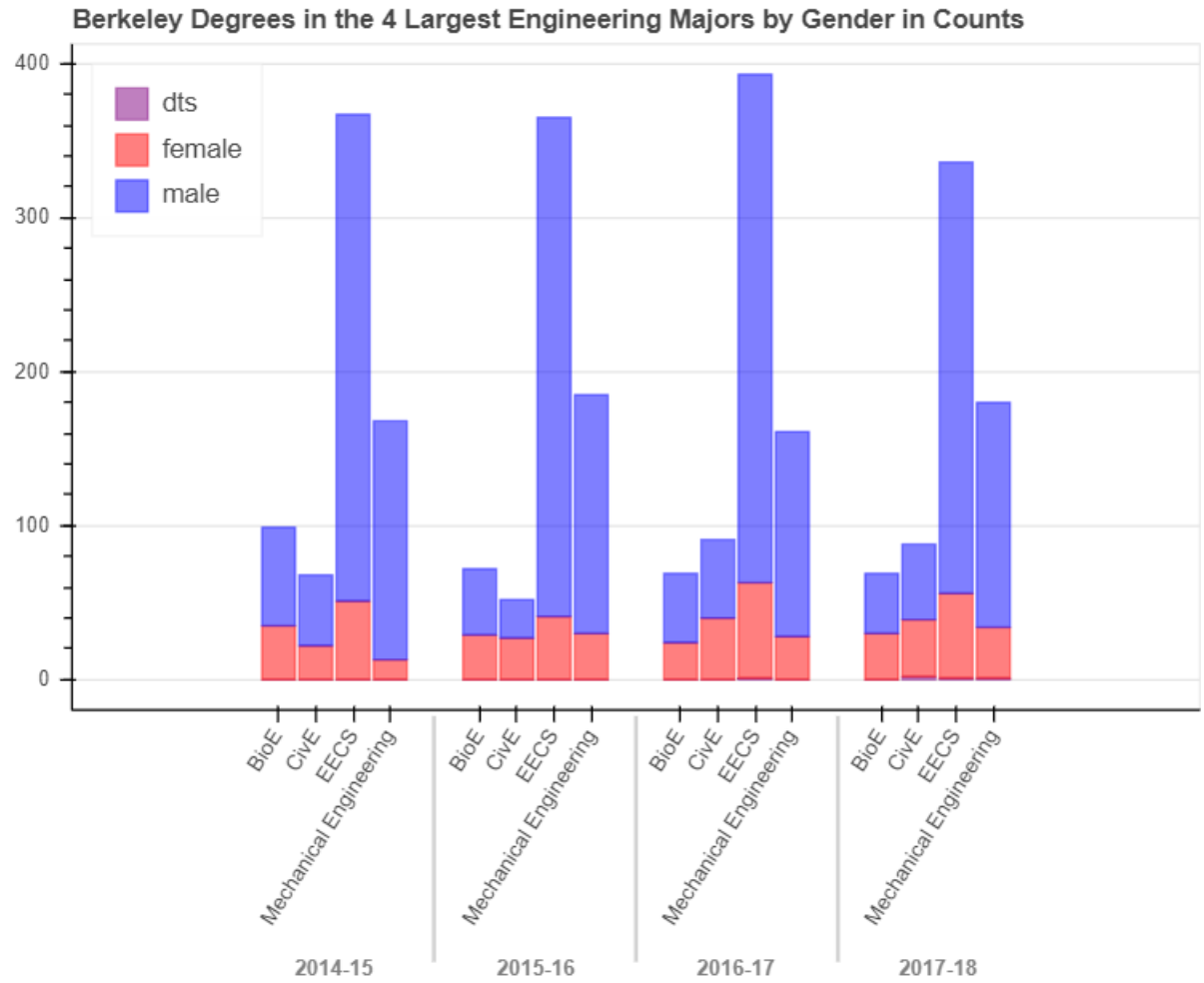Let's take a closer look at the top 4 engineering majors. *EECs is by far the largest major, but it experiences the most gender disparity.* From 2012 to 2017, the proportion of female EECS majors increased from 13.9% to 16.4%.

Bioengineering and Civil Engineering are smaller majors, but have the most equal gender representation, with *Civil Engineering notably having 51.8% of their degrees be earned by women in 2015-16.*

```
In [4]: IFrame(src='four_18.html', width=800, height=525)
```

Out[4]:

Berkeley Degrees in the 4 Largest Engineering Majors by Gender in Counts

Berkeley Degrees in the 4 Largest Engineering Majors by Gender in Percentages

"What is the proportion of bachelor's degrees earned by women in EECS?"

Overall, the proportion of EECS bachelor's degrees earned by women is very small, averaging to be around 14.3% across the past four years. The percentage has increased by 3% from 2012-13 to 2017-18.

In [6]: `IFrame('eecs_18.html', width=800, height=525)`

Out[6]:

Berkeley EECS Degrees by Gender in Counts

```
IFrame('eecs_18_percentage.html', width=800, height=525)
```

Out[7]:

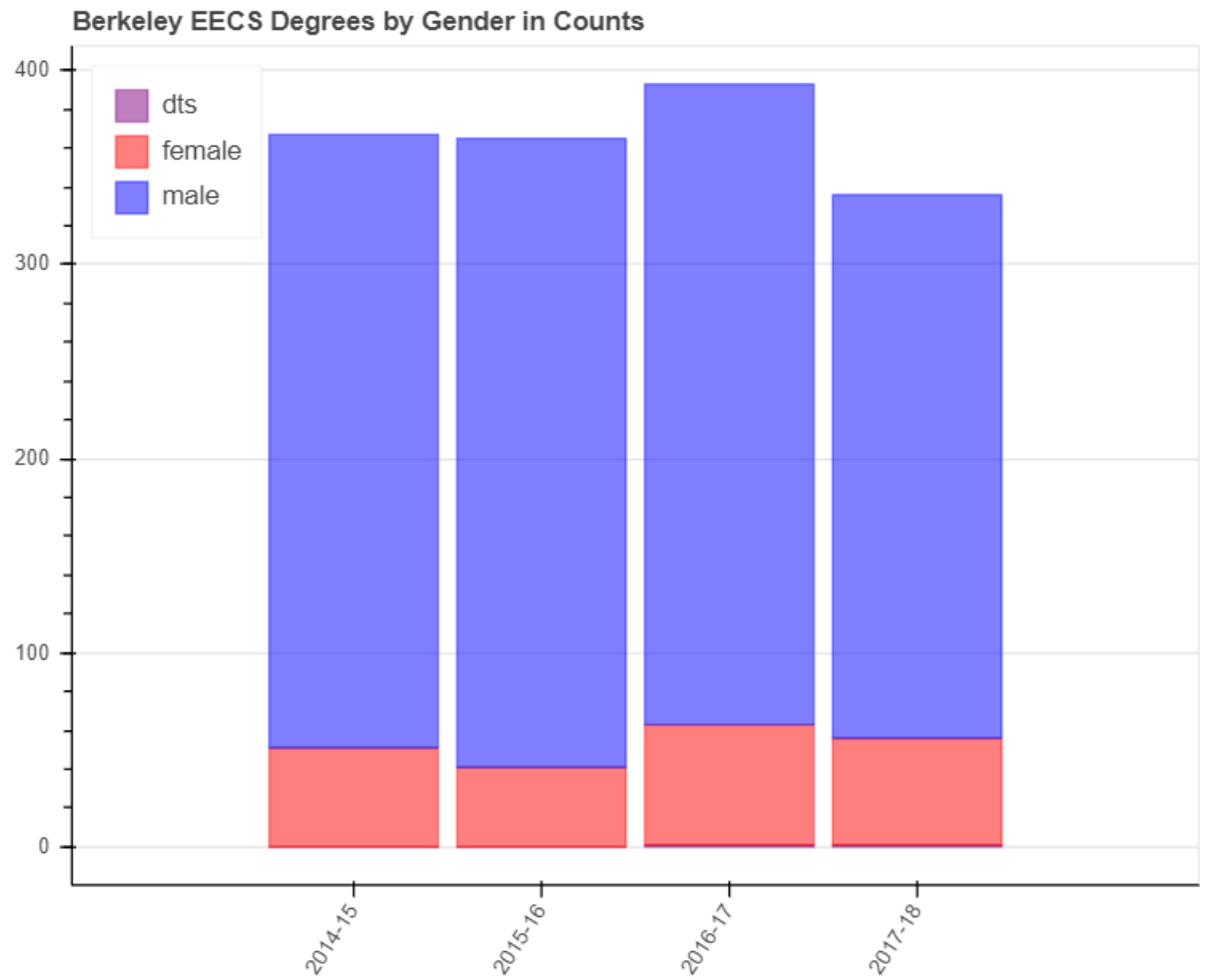**Berkeley EECS Degrees by Gender in Percentages**
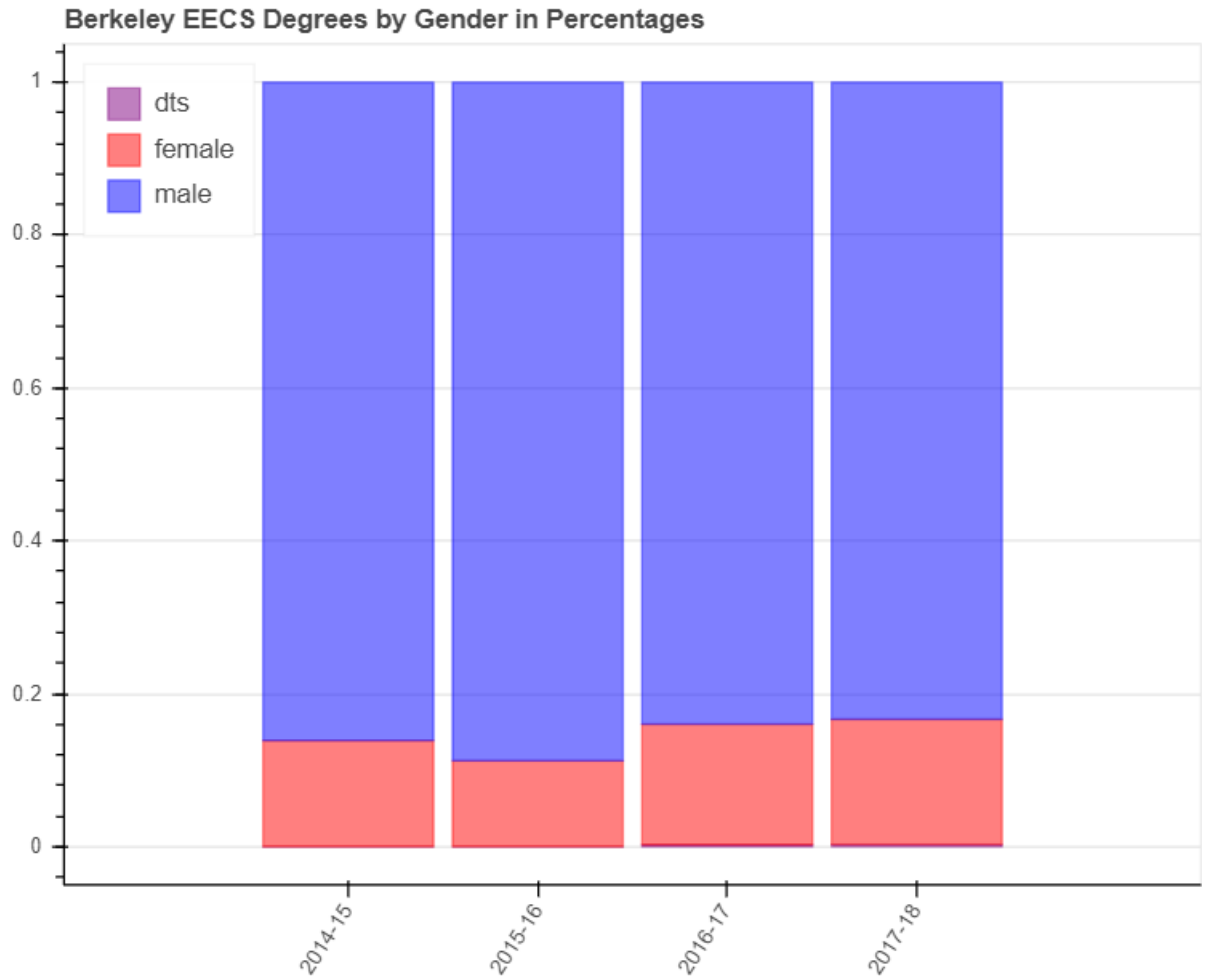
"How many female Engineering/CS degrees earned by women in all of UC? How does Berkeley compare?"

- Raw Data Source (https://www.universityofcalifornia.edu/infocenter/degrees-awarded-data)

The percentage of Engineering and CS female graduates in UC overall hovers around 20% to 30% range. Berkeley notably has more equal gender representation (as far as a 7% difference) compared to UC overall across undergrad, masters, and doctorate levels and across all years (besides two years at the PhD level, bolded below), with the highest levels of equality (avg 31.45%) occurring at the master's level.

Group	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
UC Undergrad Eng/CS Females	19.4%	20.5%	20.1%	22%	21.5%	22.8%
Berkeley Undergrad Eng/CS Females	20%	22.1%	20.9%	23.3%	24%	25.3%
UC Masters Eng/CS Females	23.8%	25.5%	26.2%	27.1%	27.5%	28.1%
Berkeley Masters Eng/CS Females	30.5%	31.7%	29.8%	30.6%	32.1%	34%
UC Doctorate Eng/CS Females	21%	22.1%	21.3%	22%	26.3%	23.8%
Berkeley Doctorate Eng/CS Females	20.3%	**19.6%**	23.5%	**18.8%**	30%	27.5%

"In what industries are UC engineering/CS graduates working?"

- Original Interactive Visualization (https://www.universityofcalifornia.edu/infocenter/uc-stem-degree-pipeline)
- More Information on UC STEM Degree Production (https://www.ucop.edu/institutional-research-academic-planning/_files/stem_degree_brief.pdf)

The top 4 industries for UC engineering and CS bachelor graduates in descending order are 1) Manufacturing, 2) Internet and Computer Systems, 3) Other Industries, and 4) Engineering Services.

However, the top 3 industries for UC engineering and CS masters and doctorate graduates in descending order are 1) Manufacturing, 2) Engineering Services, and 3) Internet and Computer Systems.

Almost a quarter of doctorate graduates remain in higher education within the first 2 years after graduation.

Below are visualizations for Bachelor's, Master's, and Doctorate graduates (in that order).

In [25]: IFrame("EngCS Bachelors Industries resize.png", width=600, height=600
)

Out[25]: **UC STEM Degree Pipeline**

| There is a steady growth in STEM major enrollments | Diversity in STEM enrollments over the past 10 years | UC STEM degree production in the state and the nation | STEM graduates earn higher wages than other UC graduates | UC STEM graduates contribute to key industries in the state |

Industry of UC STEM Graduates Employed in California, by Years After Graduation

Degree level
- ⦿ Bachelors
- ○ Masters
- ○ Doctoral

Field of study
- ⦿ Engineering & Comp Sci
- ○ Life Sciences
- ○ Medicine
- ○ Other Health Sci
- ○ Physical Sciences
- ○ Public Health

Industry groups
- ▢ Other Industries
- ▢ Performing Arts, Entertainment & Media
- ▢ Legal Services
- ▢ Public Administration
- ▢ Engineering Services
- ▢ Internet & Computer Systems
- ▢ Business Services & Finance
- ▢ Manufacturing
- ▢ K-12 Education
- ▢ Higher Education
- ▢ Health Care
- ▢ Retail & Wholesale Trade
- ▢ Accommodation & Recreation

In [24]: `IFrame("EngCS Masters Industries resize.png", width=600, height=600`
         `)`

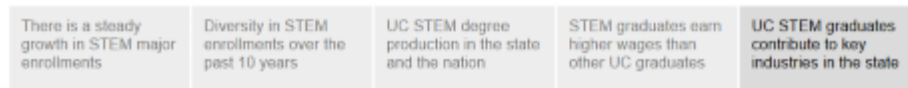Out[24]: **UC STEM Degree Pipeline**

There is a steady growth in STEM major enrollments	Diversity in STEM enrollments over the past 10 years	UC STEM degree production in the state and the nation	STEM graduates earn higher wages than other UC graduates	UC STEM graduates contribute to key industries in the state

Industry of UC STEM Graduates Employed in California, by Years After Graduation

Degree level
- ○ Bachelors
- ● Masters
- ○ Doctoral

Field of study
- ● Engineering & Comp Sci
- ○ Life Sciences
- ○ Medicine
- ○ Other Health Sci
- ○ Physical Sciences
- ○ Public Health

Industry groups
- ▢ Other Industries
- ▢ Performing Arts, Entertainment & Media
- ▢ Legal Services
- ▢ Public Administration
- ▢ Engineering Services
- ▢ Internet & Computer Systems
- ▢ Business Services & Finance
- ▢ Manufacturing
- ▢ K-12 Education
- ▢ Higher Education
- ▢ Health Care
- ▢ Retail & Wholesale Trade
- ▢ Accommodation & Recreation

```
In [26]: IFrame("EngCS Doctoral Industries resize.png", width=600, height=600
         )
```

Out[26]:

UC STEM Degree Pipeline

| There is a steady growth in STEM major enrollments | Diversity in STEM enrollments over the past 10 years | UC STEM degree production in the state and the nation | STEM graduates earn higher wages than other UC graduates | UC STEM graduates contribute to key industries in the state |

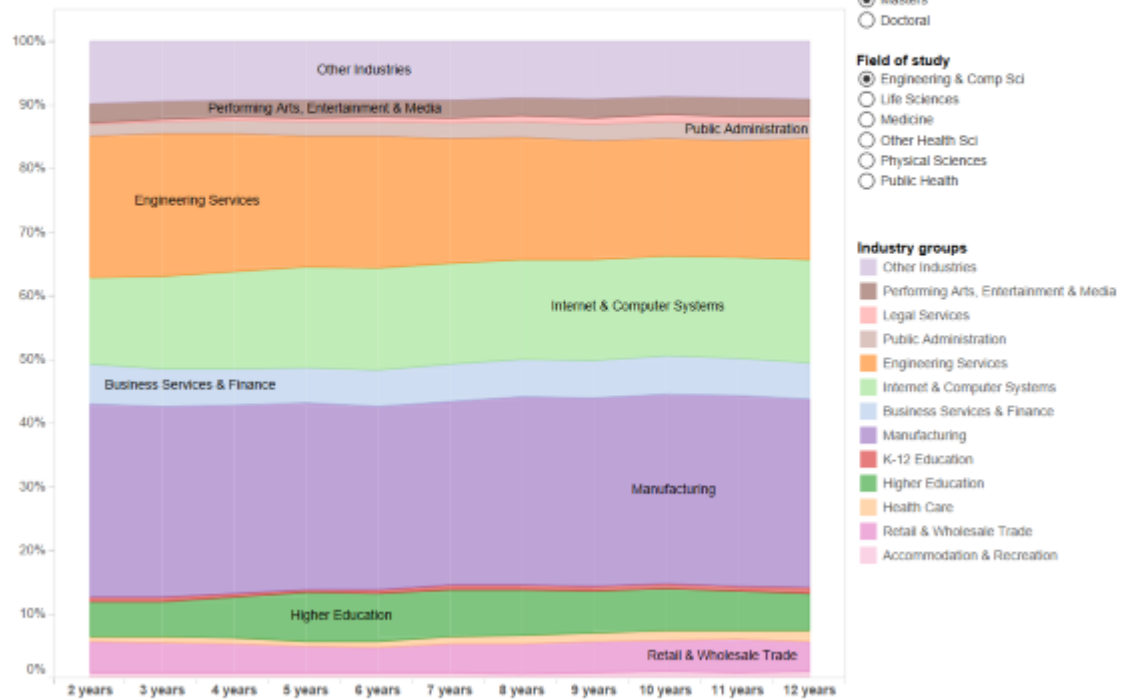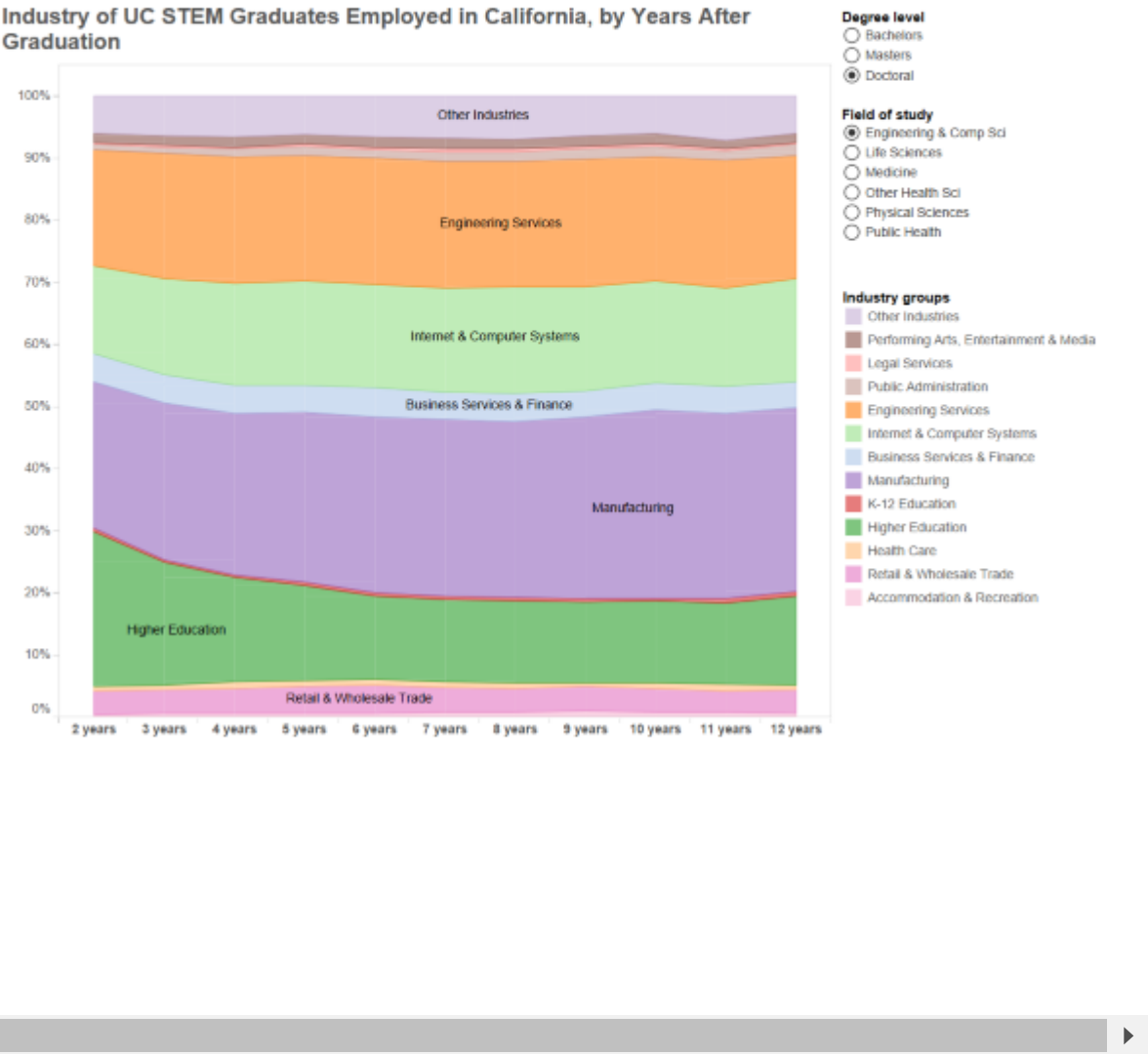### Industry of UC STEM Graduates Employed in California, by Years After Graduation

Degree level
- ○ Bachelors
- ○ Masters
- ◉ Doctoral

Field of study
- ◉ Engineering & Comp Sci
- ○ Life Sciences
- ○ Medicine
- ○ Other Health Sci
- ○ Physical Sciences
- ○ Public Health

Industry groups
- Other Industries
- Performing Arts, Entertainment & Media
- Legal Services
- Public Administration
- Engineering Services
- Internet & Computer Systems
- Business Services & Finance
- Manufacturing
- K-12 Education
- Higher Education
- Health Care
- Retail & Wholesale Trade
- Accommodation & Recreation

Contact: Rebekah Tang, Email (mailto:rtang18@berkeley.edu)