Regression: CS-Ranking

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An Application of Regression Ranking: NRC Ranking of PhD programs (2006)

- Gather raw data (x_i)
 - from institutions and other sources
 - measures of faculty productivity, student support and outcomes, diversity
- S (survey) ranking
 - Ask faculty to rate how important d = 20 characteristics are to program quality
 - Randomly draw half of faculty program ratings 500 times
 - to produce 500 sets of direct weights

- R (regression) ranking
 - Ask faculty to rate quality (t=1..6) of N specific programs in their field
 - Values of t_i used for regression
 - Randomly draw half of program ratings 500 times
 - Obtain 500 sets of regression weights for the d characteristics

NRC Weights (w_i) for CS

F	R-based 0.05	R- 0.95	R-Stdev	S-based 0.05	S- 0.95	S-Stdev
Publications per Allocated Faculty	0.110	0.135	0.009	0.132	0.138	0.002
Cites per Publication	0.067	0.095	0.011	0.148	0.155	0.002
Grants per Allocated Faculty	-0.001	0.047	0.014	0.129	0.135	0.002
Percent Faculty Interdisciplinary	0.044	0.068	0.008	0.044	0.049	0.001
Percent Non-Asian Minority Faculty	0.038	0.070	0.010	0.005	0.007	0.001
Percent Female Faculty	0.038	0.086	0.016	0.008	0.010	0.001
Awards per allocated faculty	0.083	0.125	0.015	0.099	0.106	0.002
Average GRE-Q	0.066	0.119	0.015	0.059	0.063	0.001
Percent 1st yr. students w/ full support	-0.011	0.050	0.020	0.066	0.070	0.001
Percent 1st yr students with portable fellowships	-0.054	-0.010	0.014	0.042	0.045	0.001
Percent Non-Asian Minority Students	-0.047	0.004	0.015	0.011	0.014	0.001
Percent Female Students	-0.037	-0.024	0.006	0.015	0.017	0.001
Percent International Students	-0.029	-0.003	0.009	0.010	0.012	0.001
Average PhDs 2002 to 2006	0.056	0.156	0.034	0.038	0.042	0.001
Percent Completing within 6 years	0.020	0.037	0.007	0.038	0.041	0.001
Time to Degree Full and Part Time	0.040	0.074	0.014	-0.018	-0.016	0.001
Percent students in Academic Positions	-0.001	0.021	0.007	0.070	0.074	0.001
Student Work Space	-0.020	0.030	0.017	0.008	0.009	0.000
Health Insurance	-0.020	0.008	0.012	0.002	0.003	0.000
Number of student activities offered	0.041	0.080	0.013	0.024	0.026	0.001

For each characteristic its distribution is used to determine 0.05 and 0.95 values 3

Raw Data for UB-CSE

TABLE 1: Standardized Program Values and Range of Regression-Based (R) and Survey-Based (S) Coefficients

Institution Name: STATE UNIVERSITY OF NEW YORK AT BUFFALO

Program: Computer Science and Engineering

Program ID:

(Col 1)	(Col 2)	(Col 3)	(Col 4)	(Col 5)		(Col 6)	(Col 7)		(Col 8)
		Program	Program Value	Regression	Coe	Coefficients Survey-Based Coefficients			fficients
Description	Variable	Value*	Standardized**	Minus 1 SD***		Plus 1 SD***	Minus 1 SD***		Plus 1 SD***
Publications per Allocated Faculty	V1	1,434	-0.325	0.113	to	0.142	0.159	to	0.164
Percent Faculty with Grants	V3	66.82%	-0.401	0.005	to	0.031	0.155	to	0.159
Percent Faculty Interdisciplinary	V4	28.95%	0.486	0.021	to	0.045	0.052	to	0.055
Percent Non-Asian Minority Faculty	V5	4.76%	0.743	0.063	to	0.077	0.006	to	0.007
Percent Female Faculty	V6	13.79%	0.145	0.057	to	0.069	0.010	to	0.011
Awards per Allocated Faculty	V7	0.193	-0.067	0.137	to	0.168	0.123	to	0.128
Average GRE	V8	765	-0.234	0.071	to	0.082	0.070	to	0.073
Percent 1st yr. Students with Full Support	V9	100.00%	0.723	0.010	to	0.032	0.079	to	0.081
Percent 1st yr. Students with External Funding	V10	0%	-0.507	-0.050	to	-0.019	0.051	to	0.054
Percent Non-Asian Minority Students	V11	8.33%	0.050	-0.012	to	0.007	0.013	to	0.015
Percent Female Students	V12	17.53%	-0.428	-0.011	to	0.004	0.017	to	0.019
Percent International Students	V13	85.57%	1.614	-0.031	to	-0.011	0.012	to	0.013
Average PhDs 2002 to 2006	V14	10.2	0.442	0.114	to	0.149	0.045	to	0.047
Percent Completing within 6 Years	V15	43.79%	1.033	0.007	to	0.038	0.044	to	0.046
Time to Degree Full and Part Time	V16	5.50	-0.015	0.055	to	0.075	-0.021	to	-0.019
Percent Students in Academic Positions	V17	40.48%	0.442	-0.006	to	0.009	0.083	to	0.086
Student Work Space	V18	1	1.000	0.042	to	0.066	0.009	to	0.010
Health Insurance	V19	1	1.000	0.005	to	0.030	0.003	to	0.003
Number of Student Activities Offered	V20	17	0.529	0.059	to	0.074	0.028	to	0.030

^{*} Col 3 shows data submitted by the program or calculated from these data.

^{**} Col 4 shows the standardized program value across all program values in the field, with mean of 0 and variance of 1.

^{***} Col 5 shows Minus 1 Standard Deviation from the Mean for the regression-based coefficients for the field as a whole

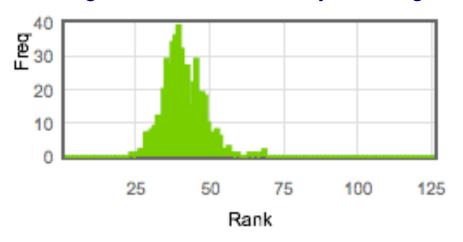
^{***} Col 6 shows Plus 1 Standard Deviation from the Mean for the regression-based coefficients for the field as a whole

^{***} Col 7 shows Minus 1 Standard Deviation from the Mean for the survey-based coefficients for the field as a whole

^{***} Col 8 shows Plus 1 Standard Deviation from the Mean for the survey-based coefficients for the field as a whole

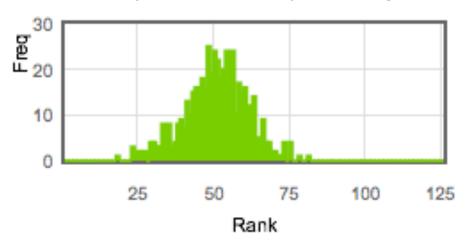
Histograms of Rankings for UB-CSE

Regression-based Quality Ranking



Range of rankings: 30-52 5th and 95th percentile Mean is about 40

Survey-based Quality Ranking



Range of rankings: 32-66 5th and 95th percentile Mean is about 50