

Judge checklist for the Tom Owen Statistics award:

Below are some ingredients of good statistical work in a project. The responses are open-ended, but generally will be something like: yes (clearly described), not discussed, implicit in the presentation, not clear. No project can be expected to include a large majority of the ingredients, but a good project will have at least one or two in each category (except 3d), and winning projects will address most of them. During interviews, judges may ask questions about points not covered in the presentation.

1. preliminary planning

(a) set-up

objectives of research clearly stated _____

population identified _____

measurements and variables defined _____

(b) design and sampling plan

design described (controls, replication, blocks, crossing, nesting) _____

randomization used _____

sample size justified (or determined) _____

sources of error (measurement, sampling variability, bias) identified _____

2. descriptive statistics

(a) data summaries

sample estimators identified and appropriate _____

tables clear and appropriate _____

(b) data visualization

graphs or plots presented _____

variables identified, axes labelled, points and lines identified _____

relationships clear and relevant _____

3. Statistical Analysis

(a) general

analysis appropriate for design _____

statistical models presented _____

(b) designed experiments

recognition that new samples would lead to different results _____

formal tests used (t-test, ANOVA, F-tests) _____

p-values used (and understood) _____

confidence intervals; coverage understood _____

Bayesian analysis; assumptions (eg, prior) and posterior understood _____

(c) observational studies

recognition and sources of bias _____

attempts to control bias _____

(d) large sample and high-dim prediction (data mining, AI, image analysis)

training and confirmatory subsamples _____

assessment of accuracy _____

false discovery rate _____

formal tests and comparisons of approaches _____

4. conclusions

conclusions clearly stated _____

conclusions consistent with statistical design and analysis _____

limitations (model fit, inappropriate aggregation, etc) discussed _____

future steps identified _____