Lesson 1: Practice Quiz

Practice Quiz, 5 questions

5/5 points (100.00%)

Congratulations! You passed!

Next Item

1 / 1 point

1.
In order to apply the method of least squares, it is necessary to know the measurement noise variances.

- True
- False

Correct
Correct! Least squares can be applied to minimize a squared error criterion, without necessarily knowing the noise characteristics of the measurements.

---

1 / 1 point

2.
For the method of least squares, select any/all that apply.

- [ ] The squared error criterion and least squares method can be applied directly to nonlinear measurement models.

Un-selected is correct

- [x] The method was pioneered by Carl Friedrich Gauss.

Correct
Correct! The least-squares method is usually credited to Carl Friedrich Gauss (1795).

- [ ] Given a linear observation model, the parameters that minimize the squared error criterion can be found by solving the normal equations.

Lesson 1: Practice Quiz

Practice Quiz, 5 questions

5/5 points (100.00%)

Correct
Correct! However, there is an additional criterion required for the solution to be valid. For more details, review the "Squared Error Criterion and the Method of Least Squares" lecture in this module.

✔ 1 / 1 point

3.
According to the weighted squared error criterion, the error term corresponding to a measurement with a noise variance of 10 units will be weighted more highly than that of a measurement with a noise variance of 1 unit.

- ○ True
- ◉ False

Correct
Correct! A larger noise covariance means a lower weight (i.e., a less trustworthy measurement).

✔ 1 / 1 point

4.
In which of these cases would the method of weighted least squares produce valid solutions. Select any/all that apply.

- ☑ Five measurements, five unknown parameters, and two different noise variances.

Correct
Correct! We have an equal number of measurements and unknowns, which means the five parameters can be estimated correctly. The non-zero noise variances affect the estimator accuracy, but not the validity of the solution.

- ☐ Ten measurements, two unknown parameters, and two different noise variances, one of which is exactly zero.

Un-selected is correct

- ☐ Five measurements, six unknown parameters.

Lesson 1. Practice Quiz

Practice Quiz, 5 questions

5/5 points (100.00%)

Un-selected is correct

- [x] Ten measurements, two unknown parameters.

Correct

Correct! We have more measurements than unknowns, which means the two parameters can be estimated reliably.

---

1 / 1 point

5.

You are measuring the voltage drop V across an electrical component using two different multimeters; one of the meters is known to be more reliable than the other. Which method would you use to estimate the best voltage value from noisy measurements?

- (•) Weighted Least Squares

Correct

Correct! WLS can handle the possibility of the measurements having different noise levels (variances).

- ( ) Least Squares
