Bundle Adjustment

5 questions

1 point

1.

Bundle adjustment corresponds to minimization of

- Reprojection Error
- 3D Error

1 point

2.

Bundle adjustment corresponds to optimization of a cost function with respect to

- Camera orientation
- Camera position
- 3D position of feature points
- All of the above

1 point

3.

Assume that we want to minimize $\|f(x) - b\|_2^2$. A first order Taylor expansion of $f(x)$ around the current value yields $f(x + \Delta x) \approx f(x) + \frac{\partial f(x)}{\partial x} \Delta x$. Then, we update as $x_{k+1} = x_k + \Delta x$ where Δx satisfies

- $\frac{\partial f(x)}{\partial x}^T \frac{\partial f(x)}{\partial x} \Delta x = -\frac{\partial f(x)}{\partial x}^T f(x)$
- $\frac{\partial f(x)}{\partial x}^T \frac{\partial f(x)}{\partial x} \Delta x = \frac{\partial f(x)}{\partial x}^T b$
- $\frac{\partial f(x)}{\partial x}^T \frac{\partial f(x)}{\partial x} \Delta x = \frac{\partial f(x)}{\partial x}^T (b - f(x))$

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1 point

4.

Which of the following tools are useful in a visual odometry framework

- [ ] Bundle adjustment over sliding window
- [ ] Key frame selection
- [ ] Visual loop closure when places are revisited

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1 point

5.

Select any answer that is an indispensable part of a structure from motion pipeline.

- [ ] Triangulation of feature points
- [ ] Object detection
- [ ] Outlier rejection with RANSAC
- [ ] Essential matrix computation
- [ ] Image blending

- [ ] Pairwise feature matching
- [ ] Bundle adjustment

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2 questions unanswered

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