Seminars in Artificial Intelligence and Robotics

Computer Vision for Intelligent Robotics

Presentation guidelines and tips

DIPARTIMENTO DI INGEGNERIA INFORMATICA AUTOMATICA E GESTIONALE ANTONIO RUBERTI

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Inspired by:
Ten Secrets to Giving a Good Scientific Talk,
Mark Schoeberl and Brian Toon

Typical slot organization

Presentations: 15 minutes

Questions: 5 minutes

Discussion: 10 minutes

Presentation slides

- Usually 1.5-2 minutes per slide
  - In any case, mandatory no more than 20 slides
- Avoid dense slides
  - In case, add one more slide
- Use relatively large fonts
  - No smaller than 16 pts

Presentation components

Introduction

Related Work and main contributions

Method

Results

Conclusion/Summary

Introduction

Problem statement

- Describe the problem your are going to address and its challenges.

Tip: You may use a picture or a video to describe the problem.

Motivations

- Convince people that the problem is important

Related Work and Contributions

Report relevant related work

– Try to understand from the paper what are the closest works and have a look at least to their abstracts.

Tip: You may report block diagram/pictures taken from such papers.

Contributions

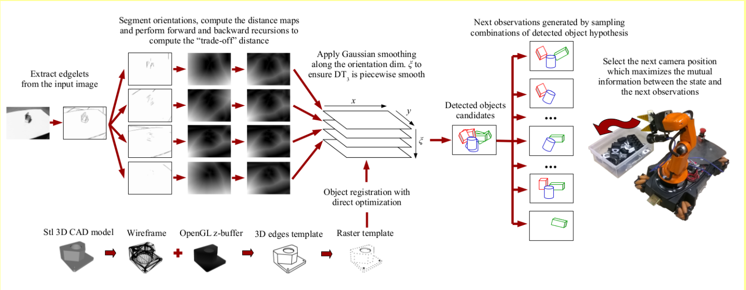
– What are the main contributions of this paper? E.g.,
  - A new method
  - A new implementation (or a more efficient one, ...)
  - A new dataset
  - An open-source implementation
  - ...

Tip: Use a bullet list, no more than 3 points.

Method (1/2)

Provide an overview of the approach

Tip: Use a block diagram/pictures that describe the whole method in a slide, e.g.



Describe the single steps, highlighting the “original” ideas.

Try to avoid equations. Show only very simple equations
Ask yourself - is showing the equation important?
Is it central to my talk?

Basic model description

$$\rho^i(t+dt) = \rho^i(t) + n^i_\rho(t)dt$$ → **Features' depths**

$$T(t+dt) = T(t) + v(t)dt, \quad T(0) = 0$$ → **Body's translation**

$$\Omega(t+dt) = Log_{SO(3)}(\exp(\widehat{\Omega}(t))\exp(\widehat{\omega}(t)dt)), \quad \Omega(0) = 0 \quad v(t+dt) = v(t) + \alpha(t)dt$$ → **Body's rotation**

$$\omega(t+dt) = \omega(t) + w(t)dt$$ → **Body's rotational velocity**

$$\alpha(t+dt) = \alpha(t) + \xi(t)dt$$ → **Body's translational acceleration**

$$\xi(t+dt) = \xi(t) + n_\xi(t)dt$$ → **Body's translational jerk**

$$w(t+dt) = w(t) + n_w(t)dt$$ → **Body's rotational acceleration**

$$\gamma(t+dt) = \gamma(t) + n_\gamma(t); \quad \gamma(0) = \gamma_0 \text{ from calibration}$$ → **Gravity**

$$T_{cb}(t+dt) = T_{cb}(t) + n_{T_{cb}}(t)dt, \quad T_{cb}(0) = T_{cb} \text{ from calibration}$$ → **Camera-Body translation**

$$\Omega_{cb}(t+dt) = \Omega_{cb}(t) + n_{\Omega_{cb}}(t)dt, \quad \Omega_{cb}(0) = \Omega_{cb} \text{ from calibration}$$ → **Camera-Body rotation**

$$T^j_{ref}(t+dt) = T^j_{ref}(t) + n_{T^j_{ref}}(t)dt, \quad T^j_{ref}(\tau_j) = T(\tau_j) \quad j = 1, \ldots, N(t)$$ → **Group j translation**

$$\Omega^j_{ref}(t+dt) = \Omega^j_{ref}(t) + n_{\Omega^j_{ref}}(t)dt, \quad \Omega^j_{ref}(\tau_j) = \Omega(\tau_j)$$ → **Group j rotation**

$$\omega_{bias}(t+dt) = \omega_{bias}(t) + n_{\omega_{bias}}(t)dt$$ → **Rotational velocity bias**

$$\alpha_{bias}(t+dt) = \alpha_{bias}(t) + n_{\alpha_{bias}}(t)dt$$ → **Translational acceleration bias**

$$y^i(t) = \pi\left(R^j_{tot}(t)\bar{y}^i_{\tau_j}e^{\rho^i(t)} + T^j_{tot}(t)\right) + n^i(t)$$ → **"Ideal" vision measurements**

$$y_{imu}(t) = \begin{bmatrix} \omega(t) + \omega_{bias} \\ e^{-\widehat{\Omega}(t)}(\alpha(t) - \gamma(t)) + \alpha_{bias} \end{bmatrix} + n_{imu}(t)$$ → **"Ideal" IMU measurements**

Method (2/2)

The method is the core of the paper: provide the “take-home message” that summarize such method.

If necessary, provide insights about the implementation.

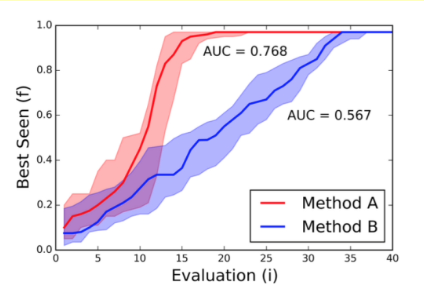
Tip: briefly and easily describe the method/implementation “tricks”

Results

Report a brief summary of the main results.

Tip: Report only the most salient results.
Do some advertisement of your paper here :) ...

Tip: Clear plots are better than many numbers, but some relevant numbers are welcome.



Conclusions

Summarize the results and implications.

Connect the results with the provided claims.

Reiterate the take-home message.

Tip: Use a bullet list, no more than 3 points.

Tips

“A (**good**) picture says more than a thousand words” … a little bit overrated, but generally true.

Practice your talk

People absorb very little information at first exposure: **reiterate the take-home message.**

Talk to the audience not to the screen.

Discussion

Provide a critical analysis about:

- Impact of the presented paper, i.e. relevance and applicability
- Novelty
- Soundness
- Main limitations

Do not describe the method

- Already done during the presentation

You may use some slides, typically no more than 5-6.

Impact

Do you feel that the significance and potential impact of the paper is high?

Verify if the **results** should be considered important

Are the proposed methods easily applicable?

Novelty

Does the paper present or expand upon novel or interesting ideas?

Does it contain significant additional material to that already published?

Soundness

Check the correctness of equations, theorems and their proofs.

Check if there are sufficient details to verify the claims.

Some mathematical detail appears unnecessarily difficult or not well described?

Main limitations

Highlight the main shortcomings of both the paper about:

- Method
- Writing
- Results

Where and why the proposed method is not applicable