Technische Universität Berlin

EINSTEIN CENTER Digital Future

# Event-based Robot Vision

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# Image (intensity) Reconstruction

# History & Evolution

# Brief history of Brightness Reconstruction

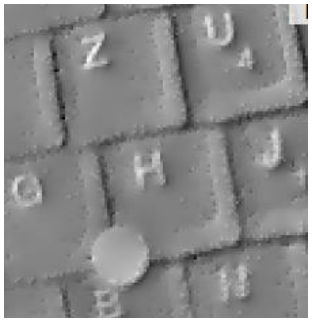
Belbachir et al., CVPRW Tuco3D

Barua et al, WACV

Reinbacher et al. BMVC

2011

Cook et al. IJCNN



2014

Kim et al. BMVC

2016

Bardow et al. CVPR

Kim et al. ECCV

# Brief history of Brightness Reconstruction

Scheerlinck et al,
AACV

Mostafavi et al.
CVPR

Scheerlinck et al,
WACV

2017

Rebecq et al. RAL

2018

2019

Rebecq et al. CVPR

2020

Rebecq et al. PAMI

# Brief history of Color Reconstruction

Scheerlinck et al,
CVPRW

2017

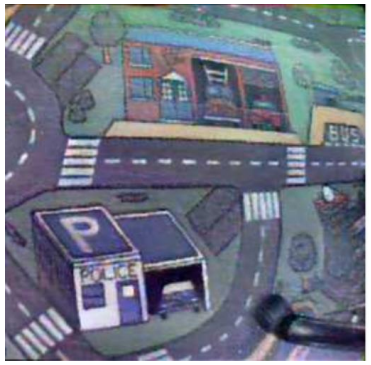
2018

2019

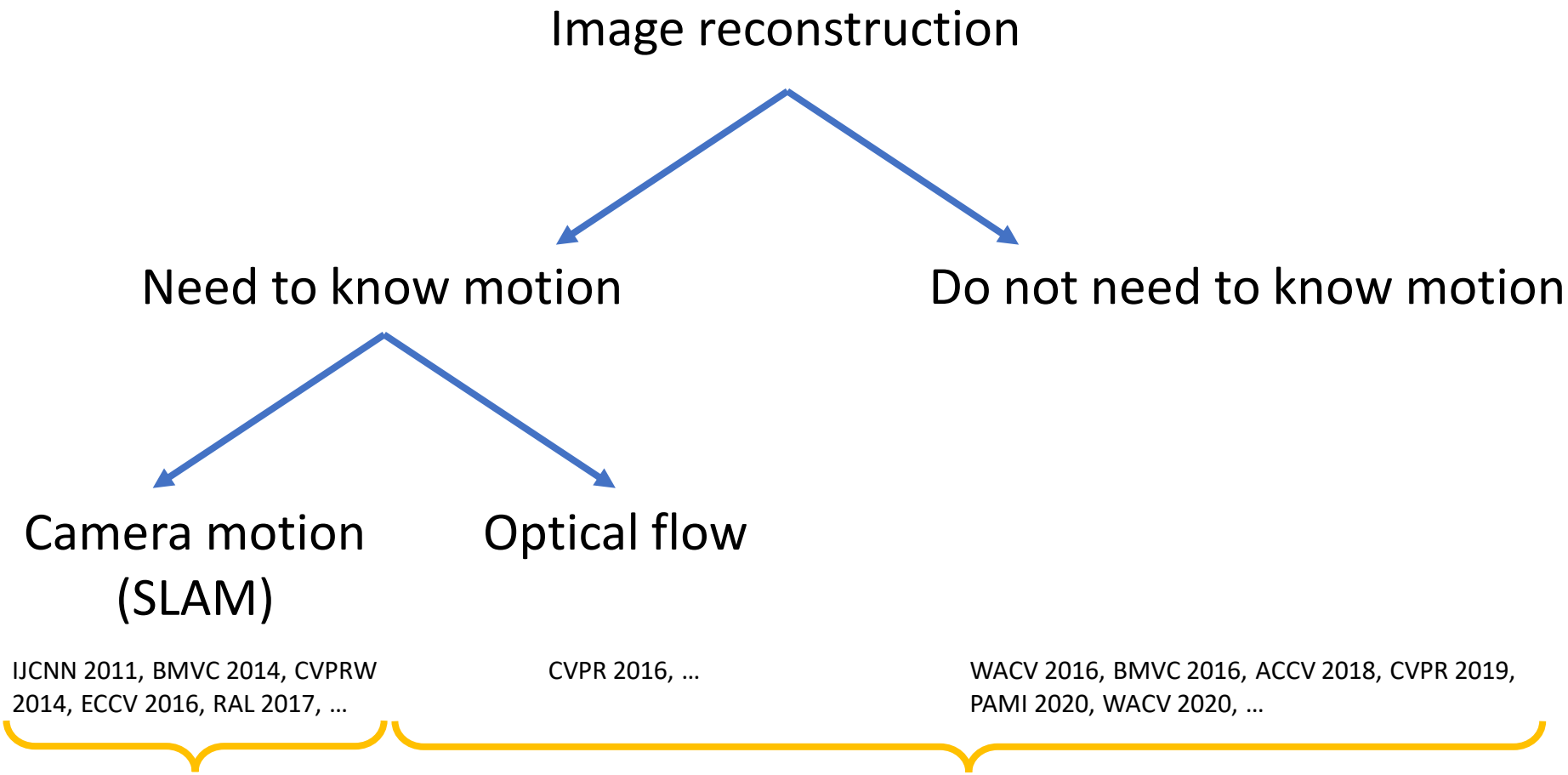
2020

Moeys et al. ISCAS

Rebecq et al. PAMI


# Assumptions & Scenarios



# Classification of Methods

- Need to know **ego-motion** (e.g., SLAM)
  - Work on static scenes: Cook et al IJCNN 2011, Kim et al. BMVC 2014 & ECCV 2016, Rebecq et al. RAL 2017, …
- Need to know **apparent motion** (e.g., optical flow)
  - Relaxed conditions compared to SLAM: Bardow CVPR 2016
  - Can work on dynamic scenes
- **Do not need to know motion**.
  Work for arbitrary scenes (most general scenario)
  - **Model-based**: Reinbacher (BVMC 2016), Scheerlinck (ACCV 2018)
  - **Learning-based**: Barua (dictionary learning), Rebecq (U-Net), Mostafavi (GANs), Bardow's thesis (GANs), etc.