

# Factorization and light- weight networks

© 2019 Philipp Krähenbühl and Chao-Yuan Wu

# Factorization beyond 1x1 convolutions

- Parameters and computation of convolution
  - $\mathcal{O}(whC_1C_2)$
- Factorized 1x1 convolutions
  - $\mathcal{O}(whC_1C_2 + C_2C_3)$

Regular convolution

Conv wxh

Factorized 1x1 convolution

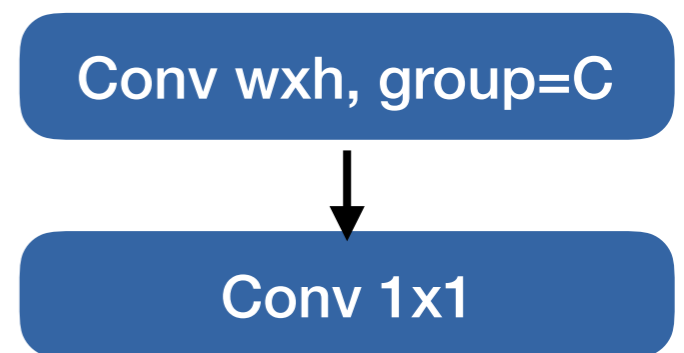
Conv wxh



Conv 1x1

# Factorization beyond 1x1 convolutions

- Factorized depthwise convolutions
  - $\mathcal{O}(whC_1 + C_1C_2)$



# Limitations

- Only learns a single spatial filter per channel

Conv wxh, group=C



Conv 1x1