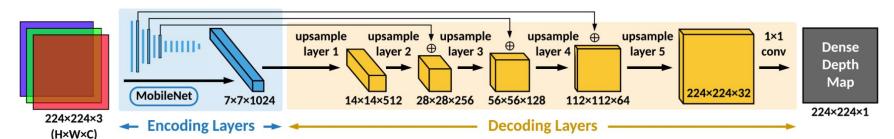
# FastDepth: Fast Monocular Depth Estimation on Embedded Systems

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http://fastdepth.mit.edu/

### Proposed architecture and features

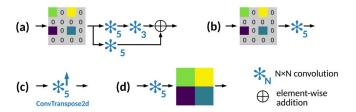


#### Proposed decoders:

- ResNet50
- ResNet18
- MobileNet (used if final solution)

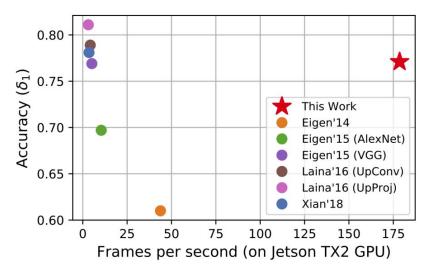
#### Proposed decoder upsampling layers:

- a. UpProj:
  - o 2x2 unpooling
  - convs 5x5 -> 3x3 + 5x5
- b. UpConv:
  - o 2x2 unpooling
  - o conv 5x5
- c. DeConv5:
  - transpose conv 5x5
- d. NNConv5 (used in final solution):
  - o conv 5x5
  - nn interpolation, scale 2



## Increasing performance

- NNConv5 as decoder layer
- Depthwise separable convolutions in decoder
- Additive skip-connections
- Hardware-specific optimization
- Network pruning



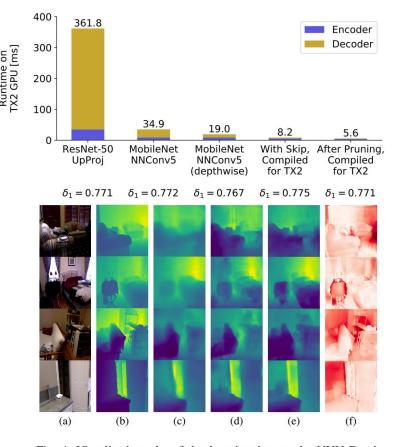


Fig. 4: Visualized results of depth estimation on the NYU Depth v2 dataset. (a) input RGB image; (b) ground truth; (c) our model, without skip connections, unpruned; (d) our model, with skip connections, unpruned; (e) our model, with skip connections, pruned; (f) error map between the output of our final pruned model and ground truth, where redder regions indicate higher error.