

[Skip to main content](#)

> [cs](#) > arXiv:1409.1556

quick links

- [Login](#)
- [Help Pages](#)
- [About](#)

Computer Science > Computer Vision and Pattern Recognition

arXiv:1409.1556 (cs)

[Submitted on 4 Sep 2014 ([v1](#)), last revised 10 Apr 2015 (this version, v6)]

Very Deep Convolutional Networks for Large-Scale Image Recognition

[Karen Simonyan](#), [Andrew Zisserman](#)

[Download PDF](#)


In this work we investigate the effect of the convolutional network depth on its accuracy in the large-scale image recognition setting. Our main contribution is a thorough evaluation of networks of increasing depth using an architecture with very small (3x3) convolution filters, which shows that a significant improvement on the prior-art configurations can be achieved by pushing the depth to 16–19 weight layers. These findings were the basis of our ImageNet Challenge 2014 submission, where our team secured the first and the second places in the localisation and classification tracks respectively. We also show that our representations generalise well to other datasets, where they achieve state-of-the-art results. We have made our two best-performing ConvNet models publicly available to facilitate further research on the use of deep visual representations in computer vision.

Subjects: **Computer Vision and Pattern Recognition (cs.CV)**

Cite as: [arXiv:1409.1556](#) [cs.CV]

(or [arXiv:1409.1556v6](#) [cs.CV] for this version)

<https://doi.org/10.48550/arXiv.1409.1556>

 Focus to learn more

Submission history

From: Karen Simonyan [[view email](#)]

[\[v1\]](#) Thu, 4 Sep 2014 19:48:04 UTC (17 KB)

[\[v2\]](#) Mon, 15 Sep 2014 19:58:29 UTC (18 KB)

[\[v3\]](#) Tue, 18 Nov 2014 20:43:11 UTC (22 KB)

[\[v4\]](#) Fri, 19 Dec 2014 20:01:21 UTC (46 KB)

[\[v5\]](#) Tue, 23 Dec 2014 20:05:00 UTC (46 KB)

[\[v6\]](#) Fri, 10 Apr 2015 16:25:04 UTC (47 KB)

☒ Bibliographic Tools

Bibliographic and Citation Tools

☐ Bibliographic Explorer Toggle

Bibliographic Explorer ([What is the Explorer?](#))

☐ Litmaps Toggle

Litmaps ([What is Litmaps?](#))

☐ scite.ai Toggle

scite Smart Citations ([What are Smart Citations?](#))

☐ Code, Data, Media

Code, Data and Media Associated with this Article

☐ Links to Code Toggle

Papers with Code ([What is Papers with Code?](#))

☐ ScienceCast Toggle

ScienceCast ([What is ScienceCast?](#))

☐ Demos

Demos

☐ Replicate Toggle

Replicate ([What is Replicate?](#))

☐ Spaces Toggle

Hugging Face Spaces ([What is Spaces?](#))

☐ Related Papers

Recommenders and Search Tools

☐ Connected Papers Toggle

Connected Papers ([What is Connected Papers?](#))

☐ Core recommender toggle

CORE Recommender ([What is CORE?](#))

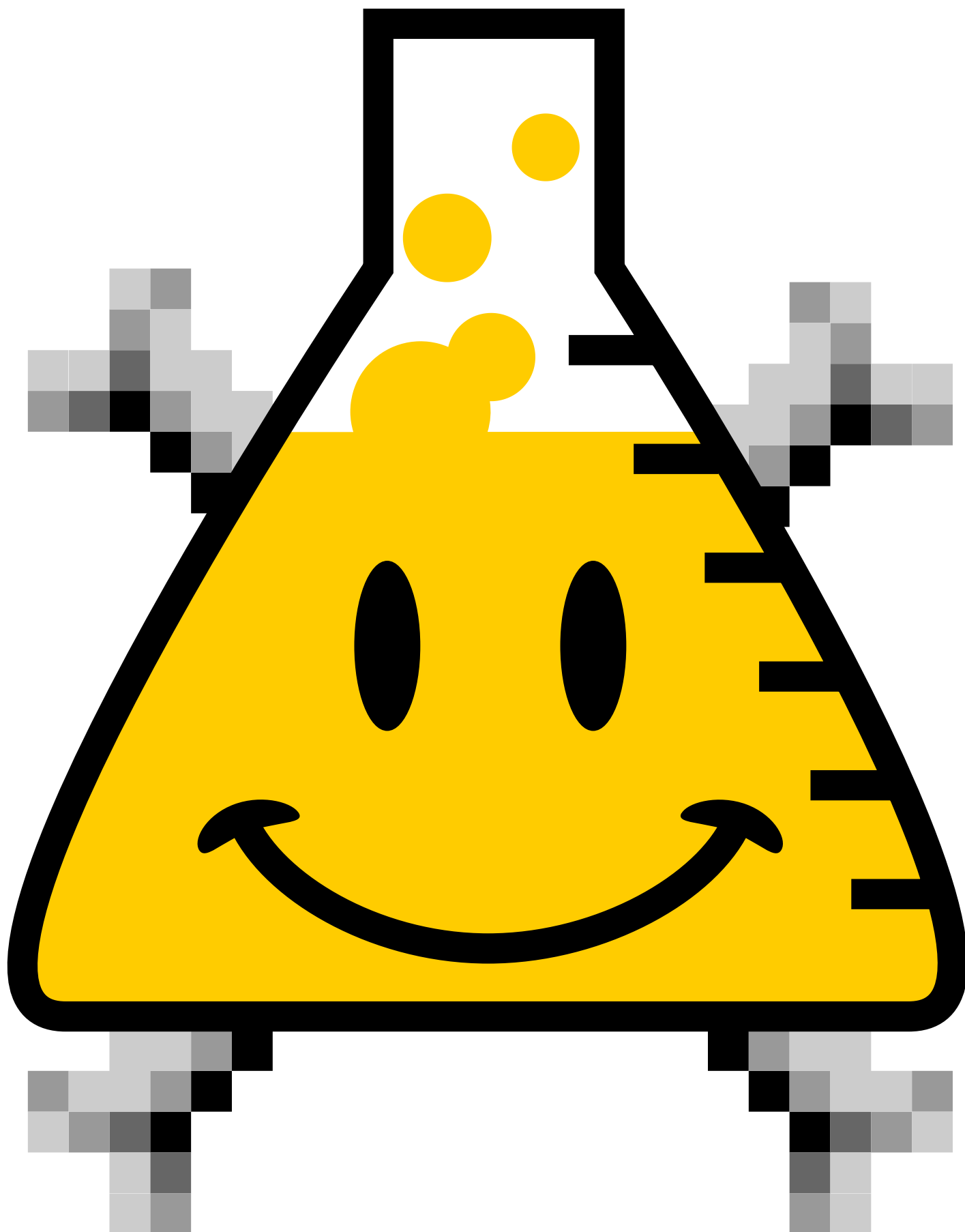
☐ About arXivLabs

arXivLabs: experimental projects with community collaborators

arXivLabs is a framework that allows collaborators to develop and share new arXiv features directly on our website.

Both individuals and organizations that work with arXivLabs have embraced and accepted our values of openness, community, excellence, and user data privacy. arXiv is committed to these values and only works with partners that adhere to them.

Have an idea for a project that will add value for arXiv's community? [Learn more about arXivLabs](#) and [how to get involved](#).



[Which authors of this paper are endorsers?](#) | [Disable MathJax](#) ([What is MathJax?](#))