# How to Contribute

We'd love to accept your patches and contributions to this project. There are

just a few small guidelines you need to follow.

## Contributor License Agreement

Contributions to this project must be accompanied by a Contributor License

Agreement. You (or your employer) retain the copyright to your contribution,

this simply gives us permission to use and redistribute your contributions as

part of the project. Head over to <https://cla.developers.google.com/> to see

your current agreements on file or to sign a new one.

You generally only need to submit a CLA once, so if you've already submitted one

(even if it was for a different project), you probably don't need to do it

again.

## Code reviews

All submissions, including submissions by project members, require review. We

use GitHub pull requests for this purpose. Consult

[GitHub Help](https://help.github.com/articles/about-pull-requests/) for more

information on using pull requests.

## Continuous Integration

Continuous Integration tests run for every PR that is sent against TensorFlow.js repositories. Any time you push to the branch, they will re-run. Before asking for a review, make sure that the continuous integration tests are passing.

To see the logs from the Cloud Build CI, please join either

our [discussion](https://groups.google.com/a/tensorflow.org/forum/#!forum/tfjs)

or [announcement](https://groups.google.com/a/tensorflow.org/forum/#!forum/tfjs-announce) mailing list.

#### Failing tests (click details for information):

<img src="https://user-images.githubusercontent.com/1100749/59696200-8fdb4500-91b9-11e9-9351-949a23fd7c75.png" data-canonical-src="https://user-images.githubusercontent.com/1100749/59696200-8fdb4500-91b9-11e9-9351-949a23fd7c75.png" width=500/>

#### Passing tests:

<img src="https://user-images.githubusercontent.com/1100749/59696439-fa8c8080-91b9-11e9-933f-a775779970f3.png" data-canonical-src="https://user-images.githubusercontent.com/1100749/59696439-fa8c8080-91b9-11e9-933f-a775779970f3.png" width=500/>

## Filing GitHub issues

Please follow the guidelines specified in the

[ISSUE\_TEMPLATE](https://github.com/tensorflow/tfjs/blob/master/ISSUE\_TEMPLATE.md)

file.

## Good places to start

Consider joining the [tfjs mailing list](https://groups.google.com/a/tensorflow.org/d/forum/tfjs)

to discuss the development of TensorFlow.js. If you're working on anything

substantial it's better to discuss your design before submitting a PR.

If you're looking for tasks to work on, we also mark issues as ["good first issue"](https://github.com/tensorflow/tfjs/labels/good%20first%20issue) and ["stat:contributions welcome"](https://github.com/tensorflow/tfjs/labels/stat%3Acontributions%20welcome)

## Adding functionality

One way to ensure that your PR will be accepted is to add functionality that

has been requested in Github issues. If there is something you think is

important and we're missing it but does not show up in Github issues, it would

be good to file an issue there first so we can have the discussion before

sending us a PR.

In general, we're trying to add functionality when driven by use-cases instead of

adding functionality for the sake of parity with TensorFlow python. This will

help us keep the bundle size smaller and have less to maintain especially as we

add new backends.

### Adding an op

When adding ops to the library and deciding whether to write a kernel

implementation in [backend.ts](/tfjs-core/src/backends/backend.ts),

be sure to check out the TensorFlow ops list [here](https://github.com/tensorflow/tensorflow/blob/master/tensorflow/core/ops/ops.pbtxt).

This list shows the kernels available for the TensorFlow C API. To ensure that

we can bind to this with node.js, we should ensure that our backend.ts

interface matches ops in the TensorFlow C API.

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We require unit tests for most code, instructions for running our unit test

suites are in the documentation.