Tedana
Decision Making/Governance Plans.
Summer 2020

This document will be a place to add text for tedana governance and decision making structures. There will be 4 overlapping sections. Each section drafter can either work in this doc or link to somewhere else. If you want editing access, ask Dan Handwerker.

1. Scope of tedana

Logan Dowdle: Lead drafter

tedana is a collection of tools, software and a community related to echo time (TE) dependent analyses. The umbrella of tedana covers a number of overlapping, but somewhat distinct ideas related to multi-echo analysis. This scope covers collecting multi-echo data (Acquisition), combining those echoes together (Combining), with optional noise removal (Denoising), inspecting the outputs (Visualization) and answering multi-echo related questions (Community). In general, preprocessed data is pushed through tedana, producing outputs that are ready for further analyses.

Acquisition.

While the development of multi-echo sequences is far beyond the current scope of tedana, the tedana community is committed to providing guidelines on current multi-echo implementations. This will include both specific instructions for how to collect multi-echo data for multiple vendors as well as details about what types of data have been collected thus far. These details are subject to change, and are intended to provide users with an idea of what is possible, rather than rock solid recommendations.

Our focus is on functional MRI, including both magnitude and phase data, however we understand that quantitative mapping has the potential to aid in data processing. Thus, we believe that some details on non-functional MRI acquisitions, such as detailed T2* mapping, may fall within the scope of tedana. Acquisition related details can be found in the tedana Documentation.

Combining.

An early step in processing data collected with multiple echoes is the combination of the data into a single time series. We currently implement multiple options to combine multi-echo data and will add more as they continue to be developed. This is an area of active development and interest.

Denoising

tedana was developed out of a package known as multi-echo ICA (ME-ICA or meica) developed by Dr. Prantik Kundu. Though the usage of ICA for classification of signal vs noise

components has continued in tedana, this is not a rule. The tedana community is open and encouraging of new methods, whether or not they have a basis in ICA.

We are interested in any method that seeks to use the information from multiple echoes to identify signal (defined here as BOLD signals arising from neural processing) and noise (defined here as spurious changes unrelated to neural processing, i.e. motion, cardiac, respiration).

tedana is primarily intended to work on volume data, that is, data that is still in structured voxel space. Surface-based denoising is not currently within the scope of tedana, but code should be written so that it is a possible option in the future.

Currently tedana works on a single subject, run by run basis however methods that use information across multiple runs are welcome.

Visualization

Though tedana does not provide a GUI for inspecting results, it does produce figures as part of the processing stream. These figures are intended to help users understand the outputs from tedana and diagnose problems. Though a comprehensive viewer (such as fsleyes) is outside of the scope of tedana, we will continue to improve the figures and add new ones as needed.

Community

tedana is intended to be a community of multi-echo users. The primary resource is the github repository and related documentation. In addition, the tedana group will attempt to answer multi-echo related questions on NeuroStars (tag: multi-echo).

What tedana isn't: While the list of things that do not fall under the scope of tedana are infinite, it is worth mentioning a few points.

tedana will not offer a GUI for usage - it is intended to be either a stand alone processing package or serve as a processing step as part of a larger package (i.e. fmriprep or afni_proc.py).

tedana will not provide basic preprocessing steps, such as motion correction or slice timing correction. While these were previously part of the ME-ICA pipeline, the sheer variety of possible choices, guidelines and data types precludes including it within the tedana package.

tedana will not provide analyses in the form of general linear models, connectivity or decoding. Though multi-echo data is amenable to all methods of analysis, these methods will not be included in the tedana package.

Sandbox:

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2. Recognizing contributions

Joshua Teves: Lead drafter

Existing contributors are recognized in README.md for their efforts via the all-contributors bot and emoji key. We are grateful for their contributions and look forward to future contributions! In cases where people contribute anything in the emoji key, we will happily and gratefully add their GitHub username to the README. Should the number of contributors exceed 25, which would be cause for celebration, we will split off contributors to a new file, CONTRIBUTORS.md. Generally, we should add contributors by calling the bot on an approved and test-passing PR if someone has not contributed before. If someone contributes through issues or project management, we should call the bot from the relevant issue that they've helped with or after a meeting on the current meeting topics issue. People who make contributions that will not be merged (such as project management or answering questions on neurostars) can be nominated or self-nominate. Contributors may ask to modify their contribution statement with a summary of what they view their own contributions as a short blurb. All contributors will be reflected in the Zenodo. Contributors with significant and sustained effort on the project will be invited to be developers by private nomination.

In the event that an entity provides financial support for a hackathon or at least one position of ten hours/week of tedana contribution over the course of at least six months, that entity will be recognized in FUNDING.md with a statement about the work financed. We hope that this helps incentivize institutional support for this and other open source projects.

NOTE: this would currently include NIMH's SFIM group under Peter Bandettini for the tedana hack, NIH for Code Convergence, and I think Mozilla supported some of Kirstie for a year? I'll check up on it if we agree on FUNDING as an idea. I'm going to push it because a general lack of funding acknowledgment is less transparent and makes it harder for grants and labs to note the long-term projects they're supporting IMO.

Sandbox:

- Funding acknowledgments for any grants which provide some amount of an FTE's time per the job description or hackathon funding
    - Either in separate FUNDING.md or in the README at the very bottom.
- Existing contributor table in README should stay or, should it get bigger, moved to CONTRIBUTORS.md
- Contributions should be recognized at PR approval and merge time for code.
- Currently one facet of welcoming is the fact that I think we do a good job of expressing gratitude to contributors. It might be nice to formalize this gratitude somehow in our contribution recognition in addition to the contributor table, so that spirit doesn't get lost if we grow.
- How to acknowledge people who do things beyond PRs, such as active contributors to neurostars

    - Perhaps maintainers can manually recognize and add these people (i.e. rely on a nomination or self-nomination system for this)
- Make clear that on contributor = on Zenodo
- Do we want to acknowledge people who make very large contributions?
    - Each person has the ability to write their own contributor statement to better acknowledge what they've done (Turing Way system)
    - fmriPrep system: Has a developers & contributors system. If someone is a contributor over a very long period of time you go from just a contributor to a developer. People on the developer list should be offered authorship on papers that build on fmriPrep in some way.
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3. Steering Committee composition/role

Dan Handwerker: Lead drafter

Rationale for a steering committee:
Tedana is a relatively small open source project that requires specialized knowledge in multiple domains. This leads to several challenges. No one person on the current tedana development team has a combination of available time plus expertise in collaborative software development, MRI physics, and advanced data processing methods to assume a primary project leader role. Even if such a person was interested, it may not benefit the project to overly rely on the existence of one person.

A steering committee can divide key roles across multiple individuals and would be a more connected group that can help organize what issues need to be discussed with the larger community.

Steering committee organizational principles:

- The steering committee steers
    - The goal of the steering committee is to help guide the direction of the project
    - Decisions in the steering committee will focus on how to present project issues to the broader community in a clear way rather than making project decisions without community input
    - Issues or PRs that can be reviewed by any community member can be reviewed and approved by the steering committee or steering committee members
    - Steering committee decisions should strive for consensus and accept the majority's decision.
        - Since votes can happen asynchronously, a majority is defined as more than half of the members of the steering committee.
        - If a member of the steering committee is unable to spend the time necessary to understand issues & vote, they can temporarily recuse from decisions so that the number of committee members is reduced
    - *[The decision making guide should discuss which review/approval powers steering committee members or the committee as a whole uniquely has]*
- Openness is a priority.
    - Openness is critical to building trust with the broader community
    - Openness provides a mechanism for non-steering committee members to identify and address steering committee blindspots
    - Openness provides a smoother transition to onboard future steering committee members
    - If steering committee discussions (written or verbal) could welcome any community member without compromising efficiency, they should be

        - The steering committee can schedule discussions without needing to ask about the availability for people outside of the steering committee.
    - If notes from meetings can be openly shared without compromising personal privacy, they should be.
- Number of people: 5? 3?
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Skills necessary for the continued development of tedana

The goal is to identify key skills and make sure people are responsible and credited for specific roles so that no current or potential volunteer fears too much work will fall onto any one person. One member can fill more than one role and people can assume some of these roles without being on the steering committee. Some key roles require someone on the steering committee, but, unless necessary, someone who is interested in filling an important responsibility, should be welcomed without also requiring them to devote time to the steering committee.

Roles:

- Task manager & record keeper
    - Helps write & keep track of notes from meetings
    - Keeps track of issues or items that should be addressed
    - Follows up with people who volunteered to address an item or alerts the broader community of known tasks that could use a volunteer
- MR physics leader
    - Someone who can make sure calculations fit within our understand of MR physics
    - Someone who can either answer MRI physics questions related to multi-echo or direct people to where they can find answers
- Processing algorithms leader
    - Someone who can make sure algorithms are appropriately implemented (or knows enough to delegate to someone who can make sure implementation is good)
    - Someone who can either answer processing algorithm questions or direct people to where they can find answers
- Collaborative programming leader
    - Helps make sure tedana is following best practices for Python code design, testing, and communication for issues/pull requests etc.
- Communications leader
    - Mailing list manager & other outward-facing communication about the project
- New contributors leader
    - Leads efforts to make contributor documentation more welcoming
    - Is a point of contact for potential contributors to make them feel welcome and direct them to relevant resources or issues
- Multi-echo fMRI support leader
    - Monitors places where people may ask questions about tedana or multi-echo fMRI and tried to find someone to answer those questions

- Enforcer(s) of the Code of Conduct
    - A person or people someone can go to if they want to report a code of conduct violation
    - If this is one person, that person should NOT be on the steering committee
    - If this is more than one person, at least one should not be on the steering committee
    - Ideal is someone who cares about tedana but DOESN'T know contributors well enough to say, "Person X would never do that"

Of these roles the only ones that ideally should be on the steering committee seem to be the task manager, because that's vital for keeping track of the project direction, and the collaborative programming leader, because many steering committee roles may intersect with those issues. It would be great for most of these to be represented on the steering committee, but, for example, if someone has the time to answer MR physics questions and guide those parts of the code, but doesn't also want to spend time on a steering committee, it's better to welcome and recognize their work as an MR physics leader off the steering committee.

Creating an initial steering committee:

- People who want to be a member of the steering committee and/or take on leadership role should self-nominate
- Every nominee should put forward a statement of their background and the role(s) they are interested
- In advance of the developers' call members should try to sort individuals into roles so that time commitments and key skills are filled.
- After this process, if there are any roles that multiple people want to fill, contributors will be given an option to vote by a specific deadline and a majority vote will assign a person to the steering committee to a specific role.
- If there is interest, it is possible to share or split responsibilities for many of the roles listed above.

Changing the steering committee

- Steering committee members can remove themselves from the steering committee at any time and open up a call for a new self-nomination
- Once per year, there should be an explicit call to the larger contributor community asking if anyone wants to self nominate for membership on the steering committee or other leadership roles. If individuals cannot reach consensus on who steps back and who assumes new roles, then a majority vote of contributors will assign people to roles where there are conflicts.
- If there are concerns with a tedana steering committee member or leader, any enforcer of the code of conduct can ask anyone to step down from a leadership role. If a person refuses to step down, then an enforcer of the code of conduct can call a vote of contributors to remove an individual from a formal role in tedana.

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Points for discussion:

- *I've avoided discussing what powers are actually held by the steering committee. That will intersect with the decision making doc. The size of the committee will also depend on what powers it has. If there's very little power, then we can be fairly flexible on committee size.*
    - *The above also intersect with what and how to open up discussions and decisions to the broader tedana community*
- *I kept the committee selection and changing guides really informal. My sense is that we don't want to be weighted down by rules designed for larger organizations. That said, we don't want to rely on consensus since that can benefit the most stubborn person. Are there things that need to be specified in advance in more detail?*
- *Perhaps once a year, give people an explicit opportunity to self-remove and others to offer to self-nominate or nominate & if any roles people need help or roles that should be split*

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4. Decision Making process for decisions of various kinds

Taylor Salo: Lead drafter

Sandbox:

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Decision-making rules

Introduction

The tedana community sets out the following decision-making rules with the intention to:

- Strive for consensus.
- Promote open discussions.
- Minimize the administrative burden.
- Provide a path for when consensus cannot be achieved.
- Grow the community.
- Maximize the [bus factor](https://en.wikipedia.org/wiki/Bus_factor) of the project.

The rules outlined below are inspired by the [decision-making rules for the BIDS standard](https://github.com/bids-standard/bids-specification/blob/master/DECISION-MAKING.md), which in turn were inspired by the [lazy consensus system used in the Apache Foundation](https://www.apache.org/foundation/voting.html),
and heavily depends on [GitHub Pull Request review system](https://help.github.com/articles/about-pull-requests/).

Definitions

Repository - https://github.com/ME-ICA/tedana

Contributor - a person listed in the [all-contributors file](.all-contributorsrc).
The community decides on the content of this file using the same process as any other change to the Repository (see below) allowing the meaning of "Contributor"

to evolve independently of the Decision-making rules.

Maintainer - a Contributor responsible for the long term health of the project and the community. Maintainers have additional rights (see Rules) helping them to resolve conflicts and increase the pace of the development when necessary. Current Maintainers:

Name	Time commitment
Logan Dowdle ([@dowdlelt](https://github.com/dowdlelt))	0.5h/week
Elizabeth DuPre ([@emdupre](https://github.com/emdupre))	0.5h/week
Dan Handwerker ([@handwerkerd](https://github.com/handwerkerd))	0.5h/week
Ross Markello ([@rmarkello](https://github.com/rmarkello))	0.5h/week
Taylor Salo ([@tsalo](https://github.com/tsalo))	3h/week
Joshua Teves ([@jbteves](https://github.com/jbteves))	0.5h/week
Eneko Urunuela ([@eurunuela](https://github.com/eurunuela))	0.5h/week
Kirstie Whitaker ([@KirstieJane](https://github.com/KirstieJane))	0.5h/week

Rules

1. Potential modifications to the Repository should first be proposed via an Issue. Rules regarding Votes apply to both Pull Requests and Issues.
    a. Every modification of the specification (including a correction of a typo, adding a new Contributor, an extension adding support for a new data type, or others) or proposal to release a new version needs to be done via a Pull Request (PR) to the Repository.
2. Anyone can open a PR (this action is not limited to Contributors).
3. PRs adding new Contributors must also add their GitHub names to the [all-contributors file](.all-contributorsrc) file. This should be done with the allcontributors bot.
    a. Contributors may also add themselves to the Zenodo file if they wish, but this is not mandatory.
4. A PR is eligible to be merged if and only if these conditions are met:
    a. The PR features at least two [Reviews that Approve](https://help.github.com/articles/about-pull-request-reviews/#about-pull-request-reviews) the PR from Maintainers of which neither is the author of the PR. The reviews need to be made after the last commit in the PR (equivalent to [Stale review dismissal](https://help.github.com/articles/enabling-required-reviews-for-pull-requests/) option on GitHub).

    b. Does not feature any [Reviews that Request changes](https://help.github.com/articles/about-required-reviews-for-pull-requests/).
    c. Does not feature "WIP" in the title (Work in Progress).
    d. Passes all automated tests.
    e. Is not proposing a new release or has been approved by at least one Maintainer (i.e., PRs proposing new releases need to be approved by at least one Maintainer).
5. The Project Leader can merge any PR - even if it's not eligible to merge according to Rule 4.
6. Any Maintainer can Review a PR and request changes. If a Maintainer Requests changes they need to provide an explanation regarding what changes should be added and justification of their importance. Reviews requesting changes can also be used to request more time to review a PR.
7. A Maintainer who Requested changes can Dismiss their own review or Approve changes added by the Contributor who opened the PR.
8. If the author of a PR and Maintainer who provided Review that Requests changes cannot find a solution that would lead to the Maintainer dismissing their review or accepting the changes the Review can be Dismissed with a vote.
9. Rules governing voting:
    a. A Vote can be triggered by any Maintainer, but only after 5 working days from the time a Review Requesting Changes has been raised and in case a Vote has been triggered previously no sooner than 15 working days since its conclusion.
    b. Only Maintainers can vote and each Maintainer gets one vote.
    c. A Vote ends after 7 working days or when all Maintainers have voted (whichever comes first).
    d. A Vote freezes the PR - no new commits or Reviews Requesting changes can be added to it while a vote is ongoing. If a commit is accidentally made during that period it should be reverted.
    e. The quorum for a Vote is five votes.
    f. The outcome of the vote is decided based on a simple majority.

Comments

1. Releases are triggered the same way as any other change - via a PR.
2. PRs MUST be merged using the "Squash and merge" option in GitHub. See the [GitHub help page](https://help.github.com/en/articles/about-merge-methods-on-github) for information on merge methods.