

MICCAI Reviewer Tutorial

9/10 March 2022

Program Chairs: Linwei Wang (RIT/US), Qi Dou (CUHK/HK), Tom Fletcher (UVA/US), Stefanie Speidel (NCT Dresden/Germany)

MICCAI submission platform manager: Kitty Wong

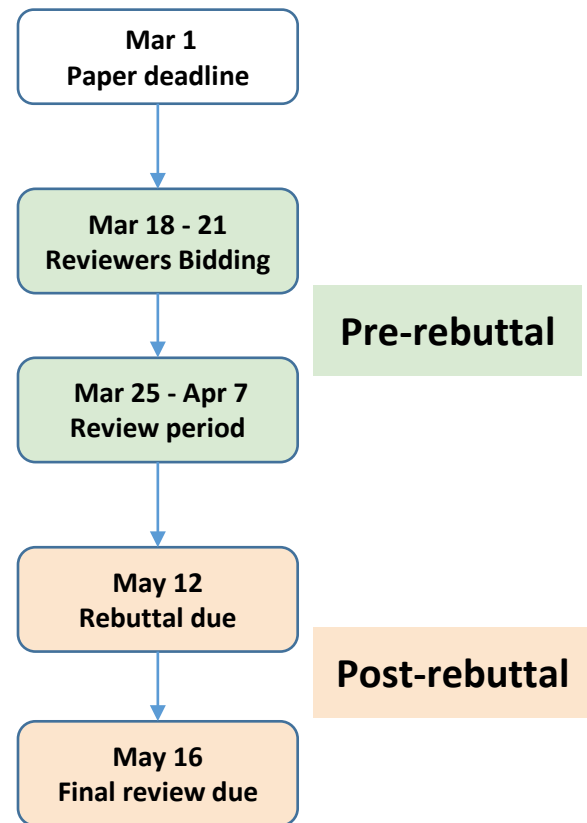


25th International Conference on Medical Image Computing and
Computer Assisted Intervention
September 18–22, 2022
Resorts World Convention Centre Singapore

Thank you very much for
reviewing for MICCAI!

MICCAI 2022 Review Process At a Glance

- **Reviews will be made public**
 - On the MICCAI website
 - For **accepted** papers
 - Including author response, rebuttal, and metareviews
 - **Without** reviewer/metareviewer names
- Reviewers have the opportunity to finalize rating and participate in discussion post-rebuttal.
 - **May 13 - May 15**



Review Bidding & Assignment (Mar 18-24)

- **March 18-21:** Reviewers bid on papers
 - Please provide your bidding to make sure you receive proper assignments
- **March 25:** Papers assigned
 - Re-assignment request must be submitted **within 48 hours**. Do it sparingly, especially if you bid for the paper assigned to you
 - Notify Submission platform manager Kitty Wong immediately for major issues, such as COI

Primary Review (03/25-04/07): Review Form

- Describe the contributions of the paper
 - A brief summary of what the authors have done and what are the findings
 - For the authors; verify that you have understood the paper
 - For the AC: quick note of what the paper is about
- Lists of major strengths
 - Provide **details**, e.g, why the paper is significant or novel
- Lists of major weaknesses
 - Provide **details**, eg. if the novelty is limited, provide citations to prior work
- Rate clarity of presentation

Primary Review (03/25-04/07): Review Form

- Comments on reproducibility
 - Authors have filled out a reproducibility checklist
 - Authors are encouraged to use open data or to make their data and code available
 - Not always possible: clear description of algo/params/dataset/evaluation is then highly valuable
- Constructive comments
 - Suggest areas of improvements to help the authors write a rebuttal and improve the paper
 - Make it really clear what you want to see in authors' rebuttals
 - Back up comments by **detailed arguments**

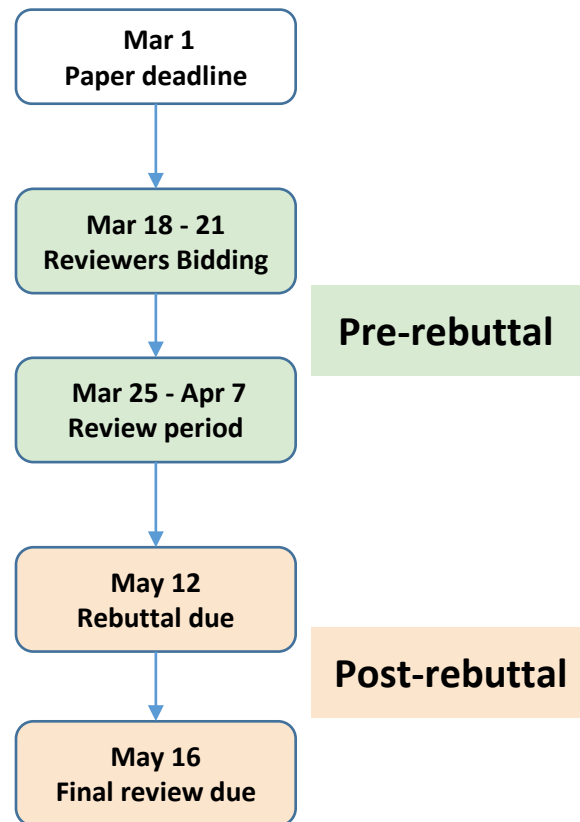
Primary Review (03/25-04/07): Review Form

- Your recommendation/rating
 - **Rate the paper on a scale of 1-8, 8 being the strongest (8-5: accept; 4-1: reject)**
 - **Spreading the score** helps create a distribution for helping ACs/PCs make decisions
 - Details
 - 8: definitely accept — award-worthy paper; you're ready to defend this if sent to discussion
 - 7: strong accept — strong paper with minor weakness
 - 6: accept — good paper with moderate weakness
 - 5: weak accept — interesting paper where merits slightly weigh over weakness
 - 4: weak reject — fair paper with weakness slightly weigh over merits
 - 3: reject — paper with moderate to major weakness
 - 2: strong reject — paper with major weakness
 - 1: definitely reject — paper with fatal flaws; you're ready to defend this against acceptance
- Justifications
 - What were the major factors in your final decision? How did you weigh the strengths and weaknesses?
 - Reasons to recommend accept or reject need to be clear to the area chairs *and* authors

Primary Review (03/25-04/07): Review Form

- Paper ranking in your review stack
 - Used to calibrate the overall rating. Avoid ties.
- Reviewer confidence
 - If your expertise is limited to a particular aspect, bring it to the attention of the AC
- Recommendation for oral presentations and YSA candidates
- Confidential comment
 - Inform the Area Chairs about any potential concerns or issues

MICCAI 2022 Review Process At a Glance



Post-Rebuttal Review (05/13-05/15): Review Form

- Final rating if changed
- Justifications for the decision
 - Provide concrete justifications of why you have or have not changed your minds after reading the authors' rebuttal.
- Participate in the discussion (with fellow reviewers and ACs) in CMT
 - Watch out for emails in case an AC is requesting your inputs on a particular paper
- Confidential comment
 - Inform the Area Chairs about any potential concerns or issues

Review Ethics

- **Avoid conflicts of interest and respect confidentiality**
 - The MICCAI review process is confidential
 - Do not discuss the paper, or (meta-)reviews, with others
 - Do not disclose names of authors / other reviewers / area chairs
- **Take enough time**
 - Reviewing is a time consuming task
 - In particular when the paper is not 100% in your area of expertise
 - But it is worth the effort: you are helping members of your community
- **Be fair and transparent**
 - Ask yourself how you would feel, as an author, if you received the review you are writing
 - Will you be fine once your review becomes public?

The Conflicted Review

Conflicted reject:

- you are currently working on the same idea and **don't** want the paper to be published
- you identify the author somehow and decide that this person does not **deserve** yet another (MICCAI) paper
- you are **angry** because the authors did not cite your papers but references are still appropriate (arXiv papers do not count!)
- you think that the **field** of research is a waste of time
- you base your decision on a suspected **nationality** of the authors

The Conflicted Review

Conflicted accept:

- you identify the author somehow **and**
- you belong to the same **institution** or have been at the same institution in the past 5 years,
- you **co-authored** together in the past five years,
- you hold or have applied for a **grant** together also in the past 5 years,
- you currently **collaborate** or plan to collaborate,
- you have a **business** partnership,
- you are **relatives** or have a close personal relationship.

What is a Good Paper

- Is the topic of interest to the MICCAI community?
- Does it present innovative ideas, new insights, or relevant impact?
- Is the evaluation sound? But remember: it is a conference paper.
- Is the paper reproducible?

Weighting between these 4 points is difficult.



Community



Reproducible



Idea



Evaluation

MIC vs CAI Papers?

Should we evaluate MIC and CAI papers differently? No, but for CAI...

- Clinical evaluation on patients is less common
- Case numbers will be smaller
- Comparing two CAI systems is more difficult than a direct comparison between two segmentation techniques
- ...

Why Make a Good Review?

- For the area chairs: to make a good/informed decision
- For the authors: to obtain fair evaluation + constructive feedback
- For the MICCAI community: to listen to and learn from an interesting program
- For your own reputation

- After a poor review
 - AC/PC will remember it (similarly if the review is late!)
 - Authors may feel unfairly treated or unwelcome
 - Attendees may waste their time

- If you expect a good review for your own paper, write good reviews too!

What Makes A Good Review?

- A review should judge the paper objectively
 - Be aware of bias (eg. if you know this field particularly well)
 - Read the literature if needed (learn from the paper)
 - Keep an open mind as many kinds of paper exist (basic proof of concept; experimental results...)
 - Assess paper as is (minor errors can be fixed, but major changes are not possible, no 2nd review)
- A review should be specific
 - Ban judgements without arguments. Critiques should be backed up with details
 - Strong supporting arguments are also needed for a paper for which you recommend acceptance
- A review should be polite and professional
 - Ban rude and sarcastic comments
 - Avoid using “you”: can be perceived as confrontational. Use “the authors”, “the paper” instead

Example of a Good Review (part 1)

- **Summary:** “Authors propose X, a new semantic and fully-convolutional segmentation architecture. X essentially is a U-Net with bi-directional recurrent skip connections. Compared to other recurrent U-Net architectures with gated RNN blocks, X uses existing layers and concat blocks and does not require any extra parameters. Authors validate the method on two segmentation tasks and one super-resolution task, outperforming baseline methods from literature and simpler architectures.”
- **Strength:** “- **Simplicity:** X's main strength is that no extra parameters are required, since the recurrence is realized directly on the layers - **Extendability:** The method can be applied to already existing U-Net segmentation problems with minor changes to the model architecture. Even though this is not investigated in this work, an extension to 3D segmentation should be straightforward, as no extra parameters are required. The high number of network parameters in 3D makes the incorporation of additional gated RNN architectures (GRU LSTM) particularly "costly", while X would keep the model complexity constant.”
- **Weaknesses:** “- **Limited novelty:** the proposed network appears like a special case of the previously proposed R-U-Net (Wang et al.), with $l=0$, without gates, and with a concat merging of the hidden layers/states. - **Limited discussion of recurrence:** in principle, authors realize a vanilla RNN directly on the hidden representations in the U-Net. Hence, training requires an unrolling of the X and backpropagation-through-time (BPTT) on the recurrence time steps, which may cause vanishing gradients (as in vanilla RNNs). Authors use very few timesteps (in this work, $t=1/2/3$). Larger temporal context, in combination with gating of units (as in GRU/LSTM) could further improve results, but to what degree this could be necessary/helpful, is not discussed here. - **Limited comparison to state-of-the-art:** Authors compare to R2-U-Net, but not to Wang et al. (R-U-Net) - No statistical evaluation of results: paired tests would give statistical weight to the argument of "superiority" of the proposed method. ”

Example of a Good Review (part 2)

- Comments:

“Lack of clarity: - Better explanation of the training stage: it would help to have a clear separation of the training and test stage. The training stage should explain unrolling of the network architecture through time (ideally accompanied by a figure), and how training is performed. - #params: Authors claim that no extra parameters are required compared to a vanilla U-Net, however, the concatenation of decode features from the previous iteration with the current iteration's encode features (i.e. the reverse direction) causes larger feature maps, which require deeper convolutional filters (i.e. more channels in each filter) and hence more parameters. This increase may be negligible in a network with 15.0M parameters, but a brief clarification would be helpful (maybe I am still misunderstanding sth). [...]

For future work, I would recommend:

- Extension to 3D: the simplicity and compactness makes this approach particularly attractive for 3D segmentation.
- Explore performance on many more problems: X could be universally applicable, but here it is used on only a few tasks. I would strongly recommend to apply X to the medical image segmentation decathlon (<http://medicaldecathlon.com/>). I would not expect X to end up leading the board, but it would be interesting to see whether X can actually scale to a wide variety of tasks, and especially in higher dimension (i.e. perform at least as good as an equivalent 3D U-Net on all tasks). If so, this could become an attractive alternative architecture next to U-Net in future. [...]

- Recommendation: “accept”

Example of an Unhelpful Review (#1)

- Summary: “This work proposed a [...] with [...] for extracting both the structural and functional connectivities from fmri data, it is very interesting work since a few works has been working on both the structural and functional connectivities patterns on this field. However, I would like to see the discussion of this work on how to expand to dynamic brain network on both the structural and functional patterns.”
- Strength: “as above”
- Weaknesses: “as above”
- Recommendation: “accept”
- AC cannot use the review and make any decision without reading the paper

Example of an Unhelpful Review (#2)

- Summary: “This paper proposes a [...] to combine generic keypoint and CNN information into a single, highly efficient memory-based model for indexing and classifying generic 3D medical image data.”
- Strength: “none”
- Weaknesses: “- no novelty according to a conference as MICCAI - no well written, so many English errors - only 1 expert on each dataset”
- Recommendation: “reject”
- Judgements are not supported by any arguments

Anonymity and Formatting

- MICCAI manuscript guidelines
 - Anonymized for **double blind review process**
 - Page limit: 8 pages main text +2 pages bibliography
 - Template: LNCS style
- We have removed papers with major issues, but may have missed some
- As a reviewer
 - Immediately notify your AC of any anonymity and formatting issues
 - But provide your review based on the **scientific merits** of the paper.
- Authors are allowed to upload their submitted papers on preprint servers (e.g., arXiv)
 - Do not search for the paper on the internet
 - If you find out who the authors are, try not to let that influence you

General remarks

- See [The MICCAI Review Process](#) and [Reviewer Guidelines](#)
- Make sure you receive emails from CMT (some institutes flag some of the emails as spam)
- All reviewer instructions are also posted on the website miccai2022.org

Thank you for your important contribution to
MICCAI 2022!