Ship Classification survey TR comments

Add the information about computational environment such as the spec of PC, a programming language and its version … etc. in experiments section.

1. Please add the citation (url) of this image. It is a sample image we can download from JAXA, right?

Check reference numbers!!! I like ordering the citation by appearance in the document.

“All conventional methods follow the above general procedure and proposed novel methods for each step.” -> What is the subject of this sentence?

“For example, according to the Indonesian Ministry of Marine Affairs and Fisheries, it is estimated that annual economic losses of Indonesia from illegal fishing reach over $20 billion. Therefore, there is a high requirement to develop an efficient and reliable maritime surveillance system to monitor and manage ocean activities around the globe” - Showing such a real number of big money is effective to support the following statement of “*high requirement*”.

If you would like to explicitly differentiate *classification* and *recognition* with a certain objective, you should elaborate them more. If not, such a description just brings verbosity/confusion.

A bit too strong message it might convey. The fact is that AIS would be somewhat effective, even though systems using only AIS do not provide sufficient performance.

Any references for ship types? The reason why I ask such a thing is that, when I looked at this list, a question arose to me: “Why fishing ship is separated into medium and small ones while other ship is independent on its size?”

Take care about the space between figures/tables and normal sentences. Many same issues are found in this document. The important key factor is **at-a-glance readability**. My comments about compound words described later stand on the same perspective.

Instead of just giving a sequence of description about each method, couldn’t you provide some structural organization for them?

I guess you tend to overuse the past tense. “How a method works” is definitely independent on the time, even if the method *was* developed in the past, so it MUST be described in the present tense, whereas the *action* of development itself by Margaret in 2011 is the past issue and therefore the use of the past tense is appropriate. In many sentences other than here, I found that the past tense is misused.

“Such as” includes the meaning of “and so on” or “et cetera”, so you must remove either one of “such as” and “and so on” here. (Of course, just removing “such as” introduces another grammatical issue and so removing “and so on” is the easier way to resolve the issue.)

“A novel radar cross section encoding feature based on backscattering features was also introduced.”- Is my understanding correct that these five words mean a kind of feature? Really many people use a compound word of several words **including participles and/or adjectives in the middle** without any hyphenation, but actually such a phrasing is a bit informal. The most frequently used adjective in such a way in papers is *based* – e.g. deep convolutional neural network based visual object recognition. “High resolution single polarized SAR images” in the previous page is also the case.Most importantly, regardless of whether it is formal or informal, it definitely makes the sentence hard for readers to understand at a glance, since the modification structure composed of the mixture of nouns and adjectives is complex and sometimes easily gives multiple meanings.I do *not* say that it is definitely wrong, but at least I would like to say that you should avoid such a phrase as much as possible. In this case, I guess that you just quoted this phrase from a paper, but at least I felt that the modification structure of this sentence is complicated.

“All the conventional methods on ship classification are based…” -Are you really confident? Some methods employing DL approach where features are implicitly extracted during the learning process are found by googling some keywords, e.g. “deep neural network ship recognition.”

Hmm… it is like a kind of a diary, instead of a scientific report/paper. The reason why I feel so is that it is described considering the timeline of things you actually did. In scientific reports/papers, the order of descriptions should not follow the timeline of what authors did, but should follow the logic.

“Experiments performed over Tokyo Bay”- **The purpose** is much more important than the place. In addition to change the title, provide the brief explanation about the purpose of whole experiments at first part in this section.(The answer seems provided in Conclusion section of this report)

“This experiment concluded that based on twenty geometric and scattering features, five types of ship clusters or patterns can be found in the SAR image of Tokyo Bay area” - And then, what? What is your focus? The number?I feel that it is not a kind of *conclusion*.For example, see <<https://owl.english.purdue.edu/owl/resource/724/04/>>

Without any related description, “this” cannot be used.

Are you clearly distinguishing these words, marine and maritime?

Such a survey on companies/services is highly preferable, instead of pure academic survey. You did good work from such a viewpoint. But I would like to add some additional requests…Couldn’t you provide brief explanation of these products/services? And also, couldn’t you provide brief description about their limitations? If they are perfect, “technology and business collaboration” is impossible (from their viewpoint).

Ship Classification SAR geometry TR comments

1. Show the numbers, i.e. quantitative evidence in abstract’s result line
2. “A recently published public dataset…” - It is not the issue when it was released…
3. “This section provides an introduction to the OpenSARShip dataset, detailed experimental (design) setting of the methods and the system (requirements )condition of experiments.” - *Requirements* is what is required to achieve something. Do you exactly *require* the described system for your experiments? For example, is Windows 64-bit OS indispensable for testing a HCF-based method?
4. You frequently use this representation, “develop xxx system.” I feel that it is not suitable under this context (and also in many other cases), because this work is not the system development but the algorithm development. Also saying “develop xxx” in this context looks a bit exaggerated (More simply saying, verbose).
5. In principle, first consider whether, at present, it is the fact independent of the timeline or not. Overuse of the past tense make the manuscript diary-like.
6. I don’t understand why you pick up the case of 50% training data, even though there is a case where improvement of more than 3% is achieved…And further, you should not just pick up one case. You can easily find a certain tendency effective for emphasizing your achievement.

Use the same precision; 63.XX, 73.2X, 74.25.

Although I accept this ‘appearance-based’ term in this report, this term is used in only abstract and conclusion. You should define and explain this term in the body part of this document.

IGARSS Paper comments

1. I think it is important to describe briefly why or how you select these 7 features from 21 conventional features.
2. “Autocorrelation feature is useful in distinguishing specifically two ship classes: cargo and tanker” - Specifically only two? How important is it to classify those two classes?

The timing for explanation does not look appropriate. “Moderate resolution” has already appeared before this part several times.

Please check the format of caption. If a figure caption is more than two lines, fully (or left) justification is used.

1. “we selected two factors: ship length and ship speed to evaluate the performance of the feature extraction methods” - Readers likely cannot understand (at least just from this phrase) how these two factors affect the evaluation. More specifically “to evaluate the performance” is too general and I cannot read what and how you evaluate using these factors. And then also “for this purpose” in the next sentence is hard to understand and the question “what purpose?” arises.

Figure should not be abbreviated at the beginning of a sentence while the abbreviated version “Fig.” should be used in a sentence. It is the common rule, even though the style depends on each society.

1. “We use Constant False Alarm Rate (CFAR) algorithm for ship detection”- the algorithm you employed for ship detection should not be mentioned in feature extraction methods section. Instead, it should be described in the Experiments section. Here what you should state is just that we focus on the feature extraction block.
2. Among all evaluation, only misclassifies samples is *negative* measure and it might reduce the at-a-glance readability. Is there any alternative measure having *positive* meaning? (Here I mean that the higher is the better with a positive measure, and vice versa with a negative measure.)
3. This part in introduction should be shortened and moved into the previous paragraph, specifically to the part with yellow marker. The key is to describe just really important items ***for your study*** and then to remove all other trivial things.
4. “A as well as B” implies that A is more important than B. The representation “detection as well as classification” therefore does not correctly convey your intention.
5. “Most of existing studies have used high-resolution images.” - Approach should be a certain high-level concept including a group of methods. In other words, the approach itself should be more universal. Instead, *papers/studies* (*study* is more broad and it includes validation and so on) use high-res images *for the specific evaluation* there. So the description “approaches have used…” is highly strange.

Using “however” at the top of sentence generally looks exaggerated and then using within the sentence is preferable.

1. The word “the” should refer to a specific thing in previous description or a common sense, etc.
2. **Inconsistency issue.** Compound adjective should be in principle hyphenated. Anyway, at least you should define a consistent rule and follow it. Ex. All-weather, day-and-night

As I pointed out in a past version, saying “feature” (what is feature in AE) is important. The key point is consistency, even though “latent representation” is the most appropriate word in the ML world. **IMPORTANT NOTE: Consistency is really really important, so you must take care about it *every time* when you make some explanation to others, not limited to papers.**

SPIE Paper comments

1. The most important thing you should emphasize is not that it is based on CNN but that it incorporates geometry information. So the latter should come first.

**Imagine what you feel** when someone says that *your method/paper is* ***poor***. You should avoid such a impolite description.

Overdramatic representation. Using “therefore” at the beginning of a sentence generally means strong cause-and-reason relationship. The connection here is not the case.

A hyphen is M U S T!! in CNN-based

Incident angle should be explained just after the explanation about using SAR geometry information for the smooth flow.

Why you quantize the angles? You should explain it here. If not, your proposal is not logical. (Logical reasoning is highly important from the viewpoint of scientific reliability which affects the reviewers’ decision.)

“Prior to testing the proposed method, we have done a preliminary analysis to check the effectiveness of a CNN for ship classification in SAR imagery”. - *Effectiveness* is a bit different from what you verified. You can say “Yes, CNN is effective!” directly from the classification accuracy. What you confirmed should be whether or not CNN correctly captures some logically reasonable features and thereby makes a reasonable decision.

“the proposed method even outperforms the conventional methods when it used few training data “ - Hmm… Why do you stick to *even* here? What you should emphasize is **not** that your method works *even* under a harder condition but that your method outdistance the original CNN more under a harder condition! It is clear that using *even* here conveys a definitely different message.

“It achieves around 2% improvement in accuracy compared to CNN without incident angle if using a half of the full training data.”- At least using *if* here is inappropriate, because *if* means a kind of *assumption* but what you should describe (and certainly what you described) is **not an assumption but a fact**.

“the experimental results are averaged over 10 trials with different initial random seed.” What is the difference between each trials.

“In order to achieve robust classification despite the changes, -> . In order to achieve robust classification to the changes, - I think “robust ~ to ~” is more common representation than “robust ~ despite ~”.

“CNN needs to learn all representations of the ship appearance.” - I think “have to” is too casual representation in paper

Change detection Survey TR comments

1. What is subtraction DI? It means differencing? Anyway, please keep unification of terminology.
2. Are there any difference between “noise” and “sudden noise”? Just “noise” is not enough?