Question Response Submission Information: Id: papers_0113 Title: WAY-GO Torch: An intelligent robotic flash light

Reviewer #49: 1) Description This paper describes an attempt to develop a pico projector controlled by a servomotor on a mobile device, used for navigation guidance and augmented reality.

The paper shows a system design of a research prototype. Lots of effort and good engineering was put into the design. However, to be of more interest to the scientific community, the paper desperately needs 1) more detailed descriptions of the key technical solutions and 2) empirical and technical evaluation. Regarding the former, some solutions like the head lock stable projection mode are very skimpily described and would not be replicable by other researchers. Regarding the latter, tt is impossible to say from the work at its present state if it will be of value for the task of pedestrian navigation. For example, is the performance afforded by projection good enough for real mobile users.

2) Clarity of Exposition Exposition is unclear. 3) Quality of References An additional reference would the work on bearing based navigation by Prof. Rod Murray-Smith's group in Glasgow. They actually tested their solution in a navigation task. 4) Reproducibility As presently described, the work is not replicable. The solutions cannot be evaluated because they are not properly described. 5) Rating 1.0 7) Explanation of Rating Because of these reasons stated above the paper reads more like a "show and tell" presentation and there is hardly anything for me to review from a scientific perspective. The work is not reproducible, neither are the solutions reviewable because they are not adequately described.

This is a shame, because the idea is interesting and the engineering work promising. In the present stage this would make a good demo at a conference. I encourage the authors to publish the work at a later point.

Reviewer #28: 1) Description This paper describes a augmented reality (AR) projector system that
projects annotations on the physical scene to assist in outdoor
navigation tasks, as well as related AR applications. The submitted
paper summarizes prior work, describes the construction of a prototype
system, and outlines application areas. However, no experimental
results are shown; furthermore, significant prior work exists in this
field. As a result, it is not clear what technical contributions, if
any, this work makes relative to prior works. To this reviewer, it
appears a robotic pan/tilt head is the primary contribution, however,
without experimental results it is difficult to view this as a
contribution of scope and magnitude warranting acceptance. 2) Clarity of Exposition
The submitted paper should be revised to meet the SIGGRAPH submission
guidelines:
- The SIGGRAPH (reviewing) format should be adhered to.
- The acknowledgments section should be eliminated in the reviewing

phase to preserve anonymity.

The paper, while only 6.25 pages, could be significantly shortened. Pages 1-2 primarily review related work and pages 5-6 summarize (hypothetical) use cases. As a result, only pages 3-4 describe the prototype. A revised version could cover the background material and use cases with fewer pages, freeing space for inclusion of experimental results.

Grammatical errors and typos need to be corrected throughout. For this reviewer's PDF viewer, random whitespaces were inserted within and between words. Addition revision suggestions, include:
- "over comes" -> "overcomes" (Abstract)
- "ubiquitously combines"? (Section 2)
- citation needed for "20 times more sensitive to green color" (Section 4.1)   3) Quality of References The number of references is sufficient for a short paper. However, it was somewhat surprising that Mistry and Maes [2009] was only briefly cited in Section 6.1; however, it seems many of the concepts presented in the paper, were demonstrated in that work. Overall, it was not clear from the related work section what aspects of this work are original to the submission vs. well-established concepts in AR projection. It would greatly benefit the work to clearly state the technical contributions in the abstract and/or in Section 1.   4) Reproducibility Perhaps the strongest positive point for this submission is the thorough discussion of the implementation in Section 4. A graduate student could very closely replicate the prototype from this description. Yet, it seems the construction of the "WAY-GO Torch" is ancillary to the applications; building such a device does not seem to support acceptance to SIGGRAPH Asia. Instead, demonstrating a new AR projection application, "breakthrough" use case, or otherwise opening the door to new avenues of research is far more important. So, while the work is reproducible from the submitted paper, much of pages 3-4 would be better suited to a supplemental document, with the primary manuscript focusing on results and user studies.   5) Rating 1.8   7) Explanation of Rating Overall, the submitted manuscript reads as a position paper more than a technical paper submission or even a systems paper. Without a single experimental result, I cannot see a path to acceptance either to SIGGRAPH Asia directly, or to TOG. At a minimum, a revised submission must clearly state the contributions of this work over the state-of-the-art; what is new: the use cases, the pan/tilt projector head, or the overall system architecture? In addition, the revised draft should focus less on fine-scale implementation details (i.e., choices of LEDs and various "dead-ends" during construction), and much more on the enabling technology and novel use cases. A user study would be particularly helpful to establish benefits over competing technologies. For example, given a navigation task, does this system

outperform printed maps, mobile phone maps, or other alternatives? Do
users find the form factor compelling vs. a mobile phone without a
pico-projector?

In summary, I recognize the considerable implementation efforts
documented by the authors. I would recommend a significant revision to
better align the paper with the scope and magnitude routinely required
for SIGGRAPH Asia papers. This could be achieved by shortening the
paper to 4-5 pages, documenting a compelling use case, and
establishing a significant advantage with a user study. Alternatively,
I would recommend the authors consider submission to user interaction
conferences, such as SIGCHI or UIST.

Reviewer #91: 1) Description The paper proposes a portable navigation device which projects
navigation signs while tracking the user position
and orientation. The paper provides detailed technical
specification of the proposed device, as well as the analysis of
to best suiting components in terms of required
energy and luminosity of displayed information.
The paper envisions a number of possible applications
for the proposed device.   2) Clarity of Exposition The paper is clearly written, but emphasizes mostly
on the hardware and software components of the proposed
navigation device. The second of part of paper
discusses possible applications of this device,
while do not provide any really investigated
application example.   3) Quality of References Yes.

Work of Raskar et al. presented at Siggrpah 2004 could be cited as well:
RFIG Lamps: Interacting with a Self-describing World via Photosensing Wireless Tags
and Projectors   4) Reproducibility The authors provide many technical details on the component
selection for their WAY-GO torch.   5) Rating 1.5   7) Explanation of Rating While many
ideas presented in the paper seem to be interesting
and building 2 generations of WAY-GO Torch required significant
engineering skills, the authors do not really show any real
application example. I would expect at least to see
images generated by the device, or preferably video showing
how it reacts for the position and orientation changes.
Once someone took the whole effort to build prototype devices
I would expect to see some analysis what are strong points
and limitation of this device in the context of best performing
applications. All such components are missing in this work.

Also, some examples of possible applications are not always

convincing. When discussing a simple flashlight mode I would
be curious what are losses of luminosity with respect to
direct light propagation without any modulator.
Projection systems on the car windshield are already exploited
in high-end models, which seems to be far more efficient
and causing less hazards than suggested by the authors
projection on the road. Also, as discussed in the paper voice messages
used in many navigation devices seem to be very efficient
in the guiding task. The authors missed a chance to compare
the effectiveness of navigation using proposed by them
device with respect to well established methods.

Reviewer #41:   1) Description The authors describe a hand-held projection system for displaying guidance information and augmentation of the users' immediate surroundings. The paper in its current form merely describes some ideas, and I think it does not meet the standards of a Siggraph paper. I encourage the authors to look at some of the past Siggraph papers, and determine if they can submit a paper which is similar in quality and contribution.   2) Clarity of Exposition There are many ways to improve the exposition. For example it is not clear what is novel. Many of the things described in your paper have already been discussed in the prior art. It is important to clearly state what your contributions are. You are essentially describing a mobile phone with a projector. Did you solve any problems related to registration of objects in the surrounding? Did you come up with new path planning method? From the paper it doesn't sound like you did. Even as a systems paper I cannot see what is novel.   3) Quality of References No, Paradiso's FindIt Flashlight work is missing for example. Other augmented reality works should be included, for example Bimber et al. and other works. Again, please look at past papers how to properly reference prior art.   4) Reproducibility No   5) Rating 1.5   7) Explanation of Rating Unfortunately I cannot consider your submission as a paper which meets the standards of a Siggraph paper. This is an interesting topic, and there are good ideas. However many have been discussed in the prior art. So clearly motivate your work, and clearly explain what is different from the prior art. Furthermore your paper should not merely be a list of ideas, but you should describe the technical details of building the hardware and the software, and validating the ideas you describe.

I encourage you to look at past Siggraph papers and resubmit a paper which clearly explains the contributions and problems you solved. Even if you decide that Siggraph is not the forum where you want to submit, I would still highly recommend to look at research & systems papers of other conferences, journals, etc. to improve yours.

Please use the Siggraph style files in future submissions.

Reviewer #93:   1) Description The paper describes the hardware for a pico projector platform with a steerable projection,
and sensors for positioning and inertial measurements.

It discussed potential usage scenarios for this type of device.   2) Clarity of Exposition

Yes, the paper is clear. There are, however, many typos and formatting issues throughout the paper.
The paper needs a careful proof read to address issues like punctuation, abbreviations, spelling
and grammatical issues.

The paper doesn't seem to follow the SIGGRAPH Author Instructions template (headings, fonts, etc.)
and there are also problems with the submitted PDF with strange word spacing in many places.   3) Quality of References OK   4) Reproducibility Yes, most technical details are in the paper.   5) Rating 2.0   7) Explanation of Rating This is an interesting project, outlining the possibilities for a handheld
projector, with steerable projection, in the form factor of a flashlight.

The authors have done an impressive engineering job of developing a prototype
that combines a projection engine, inertial sensors, GPS, servos for steering,
and a microcontroller, in a mobile, battery-powered flashlight design.

The focus of the paper is on the many applications and the potential that this
platform could enable, but in its current form, the scientific contribution is
unfortunately unclear.

The authors do a reasonable job of covering relevant work, followed by a description
of the hardware and software platform and the engineering considerations that went into
it.
While the various operating modes scenarios and usage scenarios are interesting, I had
hoped that the authors would emphasize novel hardware or software techniques, which are
unfortunately missing in this paper.

It is also difficult to assess how well the system actually works, as the submission/paper includes no
supplementary video, performance evalutation/user study, nor still images from
the system in use.

I hope that the authors can, for a future submission, revisit some of the most important related
work and clearer position their technical contributions, evaluate the strengths and weaknesses
of this platform, and demonstrate its applicability to some of the potential usage scenarios
discussed in this work.