To reviewer:

First of all, we thank you for your great effort reviewing our paper, providing so many deep and valuable comments regarding our paper, we very much appreciate it.

We have revised the introduction and abstract to provide a better picture of the problem we faced before and, hopefully, addressed the significance of the proposed technique better.

It should be noted that this paper was submitted (July 28, 2008) before the SPIE Optics and Photonics Conference in San Diego 2008 (Aug 10-14, 2008) where Zhang ZH's paper appeared. But we cited their paper in this revised version since that paper was published.

In summary, we revised our paper significantly according your comments and tried to solve the confusions that you might have encountered. We cited four papers that were published by Zhang ZH and Towers group, 1 paper from Prof. Otani's group, as well as some of our previous papers to provide the better global picture of the importance of developing such a technology. All the revised texts are typed in red in this revised manuscript.

The following answered all the issues that you commented on (blue indicates the response to the reivewer's comment and red is those statements added in this revised paper).

"Simultaneous three-dimensional geometry and color texture acquisition using a single-chip color camera" by Zhang and Yau.

SUMMARY

The authors frame this research as a means to overcome the color coupling and object surface color problems encountered when using phase shifted color fringes to measure 3D geometry, while still capturing color texture information. In this paper, the authors use a single camera with a Bayer pattern to capture projected B/W fringes, then extract 3D and aligned color texture information. This removes the need for a B/W camera to capture the fringe information and a coaligned color camera to capture color information.

The color coupling is avoided because a B/W pattern is projected, so as long as the projector is white balanced, RGB channels ideally carry the same fringe pattern*.

Well, this is not accurately addressed. Theoretically, the projector's white balance cannot ensure that the output fringe images (encoded in three color channels) would be B/W. It is a far more complicated issue than simply saying that the white balance of the projector is the only issue you need to address. For this system, there are a number of issues: 1) the fringe image generated by the computer, 2) the graphics card of the compute that connects with the projector, and 3) the projector itself. You need to ensure that all three factors are balanced to produce ideally B/W fringe images. As a matter a factor, the DLP projector's color wheel can also be removed to completely remove the color effect of the projector (as we did for our real time 3D shape measurement system).

We added the following statements in Section 1, at the end of page 6:
If the color wheel of a DLP projector is removed, as our previous system [1], the B/W fringe images will be projected automatically. However, for an ordinary color projector, three major factors determine whether the output light is ideally B/W: 1) the fringe images generated by the computer, 2) the computer graphics card that connects to the projector, and 3) the white balance of the projector. Moreover, the color spectra response of the camera will also play an important role for such a system. In order to generate the ideal B/W fringe images, the color calibration procedure is required to equalize three color channels of the whole system. For this research, since the precisely ideally balanced color channels are not required to successfully perform the measurement. We simplify generate fringe images with *R=G=B*, and adjust the color balance of the projector manually and visually.

A color camera captures three sequentially projected images; for each color channel captured, the phase can be computed point by point from the three phase shifted sinusoids, and the three images can be averaged to remove the fringe information and retrieve color texture. The surface color affects each of the three B/W images the same way, and so phase is computed from three phase shifted sinusoids that have been affected by the surface color in the same way, thereby avoiding the affects of surface color*.

We added the following statement in Section 1, paragraph 6:
The color camera is used to capture sequentially projected fringe images, from which the phase is computed point by point. Because the surface color affects each B/W fringe image projected by the projector at exactly the same manner, and the captured fringe images used for phase calculation are also affected by the surface color in the same manner, therefore, the problem induced by the surface color for each point is avoided. A phase-shifting algorithm is used because of one of its merits: pixel-by-pixel measurement.

They present three examples of a flat checkered calibration target, a flat color painting, and a human face. A white flat board is also captured to show the large intensity variation from pixel to pixel using a Bayer pattern.
* Educated guess by reviewer. Not stated in paper.

PROS
The ability to capture aligned 3D geometry and color texture easily and rapidly is an important problem, and this paper provides a good solution. Although it is not presented as a single-shot solution [1], it seems relatively fast with easy computations, simple calibration and setup using readily available hardware. This paper is elegant in its simplicity, unlike many papers whose manipulations to fix the color bleeding problems are relatively complicated.

For instance, a recent paper [1] Zhang ZH, et.al can also simultaneously capture both 3D and color texture information using readily available hardware [1]. They claim four images are required for a RGB four phase shifted method, or a single image for a FFT method. Their solution to the color bleeding problem however requires a model of the color bleeding and using nonlinear regression to find the color modulation and phase information.

We added in Section 1, on page 4 to cite Zhang ZH and his collaborators four papers related to color problem:
Zhang et al proposed a technique to alleviate the color coupling problems of the system [11, 12, 13]. For this technique, it utilized a 3x3 matrix to represent the color coupling effect of the system, which was a pretty nice approach to deal with the color coupling problem. However, calibrating the color coupling matrix could be a complicated issue since each pixel might have slightly different responses if the lens chromatic aberration is considered. In 2008, they proposed another approach to deal with color bleeding (or coupling) [14]. For this approach, four fringe images are required (even though they claimed that a single image using a FFT method might be feasible, which have not been proven yet). However, this technique requires a model of the color bleeding that uses nonlinear regression to find the color modulation and phase information. All above mentioned papers by Zhang and his collaborators tried to solve the problem of measuring color and geometry simultaneously by utilizing 3-CCD color cameras. However, none of them is suitable for real-time 3D shape measurement since more than 3 fringe images are utilized to deal with color related issues. In general, all the techniques using color fringe images suffer the problem: they may not measure the surface profile properly. For example, for a red object, the green and blue light will be absorbed, and the information carried on by these color fringes will be lost.

Another of Zhang ZH,et.al's recent publications [2] avoids the color coupling problem by projecting RGB channels separately. Their computations for computing phase and color appear to be a four phase shifted fringe version of what appears in this paper by Zhang S. They pick the RGB channel with the largest modulation to compute the phase from, and use the RGB channels to compute the color texture. Twelve RGB frames are needed to acquire the data (compared to three RGB frames for Zhang S and Yau). Zhang ZH's paper also shows there is interest in this problem and gives further support to why this paper by Zhang S and Yau should likewise be published.

Same as above

CONS

The paper does not seem to emphasize or adequately explain the principles and advantages of the main technique used to overcome the color bleeding and object color problems. The over-emphasis on using a Bayer color filter distracts from key points of the paper, especially considering a 3-CCD camera should achieve the same results. The key points to solve the color problems should be presented, then the addition of the Bayer filter discussed.

3-CCD camera could be used, but might result in unnecessary problems besides the cost of the system, which will be explained in detail in the following context. The success of this elegant approach relies heavily on this Bayer filtered technology. As a matter a fact, this technology was highly appreciated by colleagues in both industry and academia. We have applied patent for this technology even though it looks like naïve to many fellows in the metrology field. Industries (esp. entertainment) are looking for this technology for many years, that's why we are interested in developing such a technology, albeit it seems irrelevant to metrology folks.

Structural problems in the paper need to be addressed, so the paper is better organized. Many of the advantages and disadvantages of the paper are discussed in relation to a Bayer color camera compared to a B/W camera used for 3D capture (without texture). Since this paper is about the simultaneous 3D geometry/texture acquisition, the advantages/disadvantages should be in comparison to similar systems. Additional analysis is needed for white balance, chromatic aberration, and texture/geometry accuracy. Despite of the claims of being novel, very little new is added in terms of technique, analysis, or setup from previous works by the author. The small change that is made from previous works does however lead to a compelling result. Either the paper should be converted to a Letter, or additional (necessary) analysis should be performed for the work to be of significance for a paper.

Well, this is called engineering. Some slight problems could prevent the technology from advancing. Some seemingly simple and naïve solution might be the killer of those complicated solutions, and might provide better results by playing some little tricks. I agree that the camera is a common technology, the projector is a common technology, the structured light technique is not new, not to mention about phase-shifting. However, there are still a lot of research needs to be conducted to make it applicable to other fields, to make it acceptable to industries as well as other scientific research fields. Therefore, the technology proposed in this paper indeed solved a pretty big problem existing in many years, if you are familiar with industries and other related fields. Besides, we have been frequently requested to solve this problem since 2004 (4 years ago), but could not successfully find a nice solution until we came out this idea.

• There is a typo in the abstract: "The same set of fringe images can be SUED...". Should be "USED".

Sorry for this typo error and thanks for picking it up.

• The paper's structure could be changed a bit.

Section 2. Principle Section
The Bayer pattern is not essential to the ability of the algorithm to avoid the effects of color bleeding and object color effects. A 3-CCD camera could be used and achieve the simultaneous 3D geometry and texture capture. Putting the Bayer pattern first in the Principle section overemphasizes its importance to the technique, and in some ways can add to reader confusion.

The phase shifting algorithm should probably come first in the Principle Section. The most important step and one of the keys to this paper, of using the average intensity for the texture since it doesn't have fringe stripes, is only given one sentence and not emphasized nor expanded upon. Similarly, the other key step of using B/W fringes to avoid color bleeding problems isn't mentioned until Section 3 System Setup, when it should be in the Principle section. Again, it is given one sentence in passing without much explanation.

We stated the B/W fringe, Bayer filter, etc in Introduction section for our first version. In this revised version, we re-stated the detailed explanations in this section.

The following statements were added in Subsection 2.2, on page 10, phase-shifting algorithm: For this research the B/W fringe is used to avoid the color related problems. If the color wheel of a DLP projector is removed, as our previous system [1], the B/W fringe images will be projected directly. However, for an ordinary color projector, in order to generate the ideal B/W fringe images, the color calibration procedure is required to balance three color channels of the whole system. For this research, since the precisely ideally balanced color channels are not required to successfully perform the measurement. We simplify generate fringe images with $R=G=B$, and adjust the color balance of the projector manually and visually. Because the surface color affects each B/W fringe image projected by the projector at exactly the same manner, and the captured fringe images used for phase calculation are also affected by the surface color in the same manner, therefore, the problem induced by the surface color for each point is avoided. Three successively projected fringe images can be used to calculate the phase using Eq. (4). At the same time, by employing Eq. (5), the same set of fringe images can also be used to generate a B/W texture image with Bayer mosaic patterns, which can be converted to color image using a demosaicing algorithm. Therefore, the same set of fringe images can simultaneously retrieve the 3-D geometry and the color information.

The calibration should probably be in Section 3 System Setup, because it isn't key to the operating principle. It would go well after paragraph on projector color balance.

I don't agree with this, since the Bayer technology is very important for the success of this proposed technique. It should be addressed before the phase-shifting technology since it is used when we explain the 3D shape measurement technique in the phase-shifting section.

Section 4 Experiments and Section 5 Discussion

Section 4 contains both the experiment and discusses the results of the experiments. Likewise, a new experiment is shown in the Discussion Section to show the local intensity variation of the single ship camera when imaging a white card. It might be better to put the white card experiment in the Experiment section, and in Section 5 do more in depth discussion of the experiments and how their results relate and reinforce each other, rather than just list advantages and disadvantages.

We believe that showing local noise problem in the discussion section is more proper since it is not the key point of the paper, but just a possible drawback of the technique. As a matter a factor, some (more expensive) single-chip color camera allows adjust each color pixels' gain individually, and this type of problem might not be so severe. This feature is not in our current cheap camera.

Instead, to clarify this confusion, we added the following statement in the discussion session: Section 5, on page 16
It should be noted that for our very low cost camera, the local noise is significant. However, there are single-chip (more expensive) color cameras allowing for adjusting gain for each individual color pixels where the local intensity variations will not be as significant as the one we tested.

References
I would suggest reading, referencing, and compare/contrasting with Zhang, Towers, and Towers papers, as they seem to be on a parallel track to Zhang S and collaborators' various works albeit using a 4 phase shift technique and their multifrequency selection. Zhang Z's paper's do reference and discuss Zhang, Huang and collaborators.

Refer to Pros. above, we extensively cited all their papers to do color related issues.

I don't know which paper they addressed our technique [3]. As far as I knew, they have not addressed our technique by utilizing two cameras to solve the color issue in any of their papers. I guess the reviewer might mistakenly regard somebody else's papers as ours.

• White balance is assumed in the setup section. How does the color accuracy and phase estimation vary if the projector is not white balanced? In this case, wouldn't it only affect the the color texture, not the phase? Each color filtered pixel (either 3-CCD or Bayer) sees all three phase stepped sinusoids in the same color and is affected by the object color in the same way. It seems projector color balance does not affect the phase, even if the camera's color filters do not match the projector's. The color texture may not be white balanced, but that can be done afterwards in software. If true, these seem like advantages to be emphasized.

This is not the case, unfortunately. Let's give an example, if the projector is severely distorted, e.g., only projects red spectra light, and if the object surface is blue, there will be no light reflected, therefore, the measurement cannot be performed.

• Calibration is done on one color. Since B/W fringes are projected, but color components are captured, how does chromatic aberrations in the projector and camera affect color and 3D geometry estimates? Each color of the fringe pattern will have a slightly different spatial frequency, since red bends more than blue and green. See reference [2]. Can this be resolved by calibrating on each of the 3 colors?

Well, this is not an obvious issue for our system as long as the color channels are not severely unbalanced. Unlike the technique introduced in reference [2], our proposed technique is not significantly affected by this slight unbalanced problem, since the camera white balance is calibrated under the same lighting condition as the measurement. As long as the projector light does not significantly change during the calibration process and the measurement process, this issue will not be problematic for our system.

With the Bayer pattern, the phase estimates may be impacted more than if it was done with a 3-CCD camera, since the Bayer takes alternating red,blue,green phase estimates (point by point) to make a single contiguous wrapped phase estimate, where as the 3-CCD would have three contiguous wrapped phase estimates (one for each color).

It is true that using 3-CCD camera has its advantages, while its drawbacks are obvious: 1) more expensive, 2) phase calculation becomes problematic since it is extremely difficult to guarantee that 3 CCDs in the color cameras and 100% accurately aligned pixel by pixel. The misalignment could cause the phase shift error, which might be significant if the camera is at low cost. While Bayer filtered sensor does not have the alignment issue, and cheap at the same time.

We added the following statement in Section 1, on page 6:
In this research, we utilized a single-chip color camera instead of a 3-CCD camera. The reasons are: 1) 3-CCD cameras are generally more expensive comparing with single-sensor cameras; 2) The phase calculation might be problematic since it is extremely difficult to guarantee that 3 CCDs in the color cameras are 100% accurately aligned pixel by pixel. This misalignment can cause the phase shift error, which might be significant if the camera is at low cost; and 3) they suffers the same light loss as the single-chip color cameras since each sensor only captures partial spectra of the light. Of course, 3-CCD cameras might provide better image quality than single-chip cameras because local noise is smaller.

• The images look hastily captured with barrel distortion, uneven lighting, crooked. This may show robustness (although it isn't mentioned in the paper), but it looks untidy.

Bear in mind that the camera (Mightex MCN-C013-U) we used is a 190 US $ CMOS camera as specified in our system setup. The projector (Optoma EP739) we used is only $700 four years ago.

We added the price of the camera and the projector in this revised version, in Section 4, on page 12, experiments.
Before we show the experimental results, we want to emphasize that that the camera we used is a CMOS camera at very low cost US $190, and the projector is also very cheap, which is US $700 four years ago. The noise of the system can be significantly reduced by utilizing a better CCD camera and a better projector. The key of the experimental results is to demonstrate the feasibility of this proposed technique.

• There are artifacts in the 3D data, mostly where the image intensity is low. The texture appears in the 3D data. Although this is somewhat expected, it is not discussed in the paper. It also doesn't appear in the rendered 3D object when viewed off axis. It looks significant enough to affect the mesh, and widespread that it wouldn't be smoothed out by the gaussian filter. Can you show noisy 3D data and a smoothed one so we can get a sense of how much smoothing is occuring, or whether a Median filter might be better?

The noises are mostly caused by the sensors (camera and projector) used, as addressed above. Only 3x3 Gaussian filter is used, the noise is not reduced drastically. However, unfortunately, median filter will not drastically reduce this type of noise due to its internal processing nature. A mean filter might produce better results, but mean filter is less extensively used because it has some bad features for image processing.

• Fig 4c, shows a cross section with +/-1mm accuracy in z. The paper says this technique provides absolute phase after calibration, so why does the figure show distances +/-? How far away was the target? Is this typical accuracy? Although the phase extraction was discussed in an earlier paper, no mention of the accuracy was given in this paper. Since this paper is concerned with simultaneous extraction of 3D geometry and color texture, how does the accuracy of one affect the other? Is it ever better to use two cameras instead of one?

The accuracy is determined by the calibration accuracy, the system sensor noise, and the measurement condition. I guess this is not the key issue that should be extensively addressed in this paper. To answer your curiosity, the +/- sign was the measurement error when the object is set at the xy plane of the coordinate system. The calibration accuracy is approximately RMS 0.5mm for the measurement area of approximately 250mm(H) x 250 mm(W) x700 mm(D) range. The object was set approximately 1.5 meters away from the system for this measurement.

Regarding your last question, everyone has different opinion for using two cameras or just one camera. Nothing is perfect in the world! You need to obtain something to scarifying something else, right?

The key of this paper is to obtain precisely (100%) aligned 3D geometry and color texture, which has been successfully demonstrated, we believe.

• Page 13, "if this method is applied to our previous system[10], it can also do real-time 3D shape measurement with color texture" Page 14 Fast speed, also. More information is needed, as readers may not be familiar with your other research, even if its just "the previous system projected B/W fringes, used a B/W camera to capture fringe images, and a slow averaging coaligned color camera to remove the fringes and capture texture images."

Well, the reader needs to read our previous papers. That’s why the references were provided. Even though, we added one paragraph in Section 1, on page 3, to summarize our previous work and provide some background knowledge for solving this problem.
Our research endeavors to develop techniques for real-time 3-D shape measurement. In our recently efforts, we have a developed real-time 3D shape measurement system that can perform simultaneous data acquisition, reconstruction and display at 30 frames/sec[1] by utilizing a fast three-step phase-shifting algorithm[2]. We recently developed techniques to do

real-time 3D absolute coordinate measurement by employing GPU techniques [3, 4]. In our paper [1], we also addressed a problem to obtain color by utilizing an additional color camera. However, obtaining precisely aligned geometry and color texture remains not very difficult. Over the past few years, we have been constantly requested to develop a simultaneous geometry and color texture acquisition technique for our real time system. They all required that the color texture should be precisely aligned with 3-D geometry point by point for each frame. In the meantime, the cost of the system should not be very much increased. In this paper, we propose such a technique that uses a single-chip color camera to simultaneously capture the geometry and color texture simultaneously. The major advantages of this proposed technique are: 1) acquire 3D geometry and color texture simultaneously, 2) has the potential to implement into our real-time system, 3) acquire color texture that is precisely aligned with the 3D geometry, and 4) Cost is not significantly increased.

• Many of the advantages/disadvantages are compared to a B/W camera for 3D capture. The premise of this paper is that this is better than a B/W camera for 3D capture and a color camera for texture. The advantages/disadvantages should compare to the BW/color camera combo.

I think I have addressed in this introduction section. No need to repeat again.

Low cost. The B/W camera with or without the Bayer Filter costs the same. This argument is weak. A better argument perhaps is with other systems, color bleeding can be prevented by replacing color wheel of projector (expensive/difficult), multiple cameras. Others use 3 chip CCD (where as you use standard Bayer).

Well, these arguments were even weaker because the hardware costs of different systems are different. Our argument is that we do not increase the hardware cost at all to obtain simultaneous and precisely aligned COLOR texture as a BONUS.

Longer Exposure. B/W vs color (Bayer?). This argument could use a bit more explanation. Yes, the color filter on each Bayer pixel filters out 2/3's of the light, but this technique could be used on a 3-CCD camera with dichroic filters in which case a majority of the light will be captured. Again, the discussion of the effects of using a Bayer pattern is interfering with making the advantages of the main technique obvious. Many of the disadvantages appear to come from using a Bayer pattern, not from the technique itself. In fact, using a 3-CCD camera would allow the color fringe with the largest modulation to be used for phase computation (similar to Zhang ZHs work [2]), and capture a full resolution texture that matched the resolution of the 3D geometry. The pixel to pixel intensity differences would be lower, which may lead to better signal to noise ratio (and less need for the Gaussian averaging to remove noise which must lower resolution), and lead to better light collection.

Are you only selling for Zhang ZH’s works? Just kidding! Besides the drawbacks of 3-CCD cameras addressed previously, 3-CCD cameras suffer the same type of light loss as Bayer filter cameras. Prism is usually used to separate the incoming light into three parts, red, green, and blue, which are then passed onto the sensor. Therefore, only about 1/3 of the light for each color channel is captured for a white light. Even though Zhang ZH's paper did not notice this problem, but it was there unfortunately.

The point by point phase estimation is needed since the Bayer pattern alternates between red, blue and green, so there may be a significant intensity variation in a 2x2 grid which may affect an estimate based on neighboring points. If a 3-CCD camera is used, there will be less intensity variation (a white board will be an even color in red, green, blue), so this wouldn't be as much a problem. The point by point phase estimation can be augmented with local variations to detect large gradients or discontinuities which affect phase wrapped systems.

This is true to this sense, but the geometry measured would be problematic besides its more cost, as already addressed.

In other words, most of the disadvantages of the techniques described in the paper are due to a Bayer pattern being used instead of a 3-CCD camera. The use of a Bayer pattern is usually just a inexpensive way to replace a 3-CCD camera, since the colors are spatially multiplexed. Although the ability to use a Bayer pattern camera is advantageous in terms of cost , it in some way confuses the description and advantages of the main technique to solve the color problems by adding an additional (unncesssary) layer of color demultiplexing (which is well known) and the associated problems with the Bayer pattern described above. I would suggest discussing the techniques to solve the color problems without the Bayer pattern, then add the Bayer pattern and discuss further advantages and disadvantages.

The whole point of this paper yet: Low cost (no increase), simultaneous geometry and color texture measurement, and possibly for real-time 3D shape measurement. Of course, 3-CCD cameras will work too although it might bring other problems.

• The paper does not seem to emphasize the principle and advantages of the main technique used to overcome the color bleeding and object color problems; They are mentioned in one sentence in the principle section and in another sentence in the setup section. It would help the reader to describe how variations in color bleeding and object color do not affect the phase and color estimates, rather than just stating that with B/W fringes it isn't a problem. Similarly, there is not much emphasis given to the limitations of this technique, such as when the fringes aren't color balanced or the effects of chromatic aberration.

Already done, in the introduction part, refer above.

• Despite of the claims of being novel, very little new is added in terms of technique, analysis, or setup from previous works by the author. The use of color phase shifted fringes for single pixel phase extraction and phase unwrapping have been previously published. The equations and calibration techniques are from previous works. The Bayer filter and color deinterlacing (from the averaged image) are well known.

I am pretty sure that our paper provided an elegant solution for this problem instead of utilizing multiple fringe images, or 3-CCD camera, or color coupling matrix, etc. We have received great comments from the SPIE conference this year at San Diego. We believe many audiences were very much impressed by this elegant solution, even though we may not be able to convince you that our paper is important.

The main techniques of this paper used to remove the color bleeding and object color effects and to capture the color texture are the use of B/W fringes and averaging the fringes to produce a fringeless image. These ideas both mentioned in one of the author's (Zhang S) previous works "High-resolution, real-time three-dimensional shape measurement" [3]. It states, "Color tolerance: Unlike those real time systems based on color-coded structured light methods, this system uses B/W fringe images. Therefore the object color does not affect the measurement accuracy." " ...averaging the three fringe patterns washes out the fringes ...", although they use the camera's exposure time to do the averaging, rather than do it in software. Also, "It should also be noted that we can also obtain a B/W image for the texture mapping by averaging the three phase-shifted fringes". One of the future works this paper suggested was to simply replace the B/W camera with a color camera.

The fact that a small change in the setup has produced the desired ability to capture simultaneous 3D geometry and color texture is not lost on this reviewer. However, with this in mind, the results should be either presented as a Letter (which I don't believe gives the end result the proper exposure it deserves), or more in-depth analysis should be performed.
I do recommend that this paper be published, but the paper needs to be revised with some structural changes and additional analysis to present the work in its best light.

In addition, we made the following changes in this paper:
Abstract: on page 2, line 1, we added
and rapidly

Abstract: on page 2, line 3, we added
Using a single color camera either reduces the measurement speed or drastically sacrifices the measurement quality

Abstract: on page 2, line 11, we added:
Since only three fringe images are required, this technique is suitable for real time 3-D shape measurement.

Section 1: page 3, line 3, we added:
With recent advancements of real-time 3-D shape measurement technologies, the

Section 1: page 3, line 3, we added:
With recent advancements of real-time 3-D shape measurement technologies, the

Section 5: page 15, 6 lines from bottom, we added:

It should be noted that even if a more expensive 3-CCD color camera is used in such a system, the exposure time still needs to be significantly longer since only partial of the light is passed onto each individual sensor.

I hope that our effort to revise this paper has already satisfied your requirements. We really appreciate your great efforts to providing such knowledgeable and deep comments on our paper.

References.

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3. Zhang S, Huang PS. High-resolution, real-time three-dimensional shape measurement, Optical Engineering. 45(12) (2006)