Rebuttal

Summary of all reviews from the Primary Reviewer.

1. Visualization of more datasets, particularly, the ones, as R1 has mentioned with crossings at other angles.
2. Effects of choice of length in metatract generation.
3. Performance studies and limitations.

Reviewer 2:

1. I feel the background section could be improved. Why the orientation and weaving patterns of fibers indicate the strength of the material, and thus why the trouble to scan the materials, extract the fibers and visualize them. The paper gives some relatively high-level description of this but more background would be appreciated.
2. The authors claim that their method can deal with low resolution data.  
   But this might be in the eyes of the beholders, since in my opinion the example data in the paper all have fairly high resolutions. Perhaps a comparison with a really high resolution data using this method and other existing methods could diffuse the doubt.

Reviewer 1:

1. A new variable, reliable Hessian, is defined and it is stated that "R\_H is similar to the "vesselness".  Later on, the authors claim "the utility of the vesselness is a little different from our framework". Matching term by term between the definitions of "vesselness" and "R\_H", they are the same. The authors are encouraged to state clearly the originality and contribution of "R\_H".
2. In the examples presented, it seems only one type of composite was studied. For instance, there is no example showing a composite with fiber bundles that cross each other at an angle < 90 degrees. When two bundles are almost parallel, will the current algorithm be sufficient to separate them apart? The authors are encouraged to provide more than one fiber configurations.  
   There are a couple of typos.  In Figure 3. the square is white color instead of green color.
3. "All clustering was done in R" and the letter R is not explained.

Reviewer 3:

1. The reader does not get a sense of what the typical sizes of the datasets would be and/or if the sizes of the datasets used in this paper are indicative of typical sizes.
2. The literature survey while being complete and a good read, is long.
3. Since the algorithm revolves around construction of Metatracts, it is hard to understand the effects of choice of length (threshold) for Metatracts.
4. For the sake of argument, it is a known practice in the material sciences community to use tensors to describe orientation of fibers in FRPs - however there is no mention about it or techniques related to the tensor representation in the literature review.  
   S. G. Advani and C. L. Tucker. The use of tensors to describe and predict fiber orientation in short fiber composites. Journal of Rheology (1978-present), 31(8):751–784, 1987.

Review 4:

   1. In Section 5.1, k-means is applied to the m-dimensional space using  
   Euclidean distance, i.e., each dimension is considered equally important.  
   Is that really the case when they represent eigenvectors?

   2. In Section 5.2, the authors mention that they remove short Meta Tracks.  
   How much data is thrown away here? Can examples be provided to get a  
   better understanding?

   3. Figure 7 is too cluttered to see the individual clusters and the colors  
   are not chosen well either. Maybe explicitly show individual example  
   clusters where things go wrong and blend out the other clusters.

   4. What are the limitations of the approach? Are there data sets where the  
   method fails?