We claim:

1. A system for improved generation of 3D avatars for virtual try-on of garments, the system comprises:

a memory storing program instructions;

a processor executing the instructions stored in the memory; and

an avatar generation engine executed by the processor and configured to:

receive inputs from a first user type, via a first input unit, for generating one or more garment types in a graphical format, wherein the inputs for generating the one or more garment types comprises a fully stitched garment image, a 2D flat image of the garment or a 3D sketch image of the garment;

generate a 3D avatar of a second user type by capturing a first input type or a second input type respectively received via a second input unit, wherein the first input type comprises measurements of body specifications of the second user type and the second input type comprises body images of the second user type captured from different angles via a camera present on the second input unit in a 2D format and received by employing a body measurement Application Programming Interface (API),

wherein the 3D avatar of the second user type is generated by parallelly implementing a combination of deep learning techniques including Convolutional Neural Network (CNN) technique, a Graph Neural Network technique and a Capsule Neural Network technique on the second input type, selecting the technique that provides a high accuracy for computing one or more body measurements of the second user type to obtain a segmented output image, implementing a combination of classification techniques on the segmented output image including Bayesian, k-Nearest Neighbors (k-NN), Support Vector Machine (SVM), decision trees, adaptive boosting, random forest, Multilayer Perceptron (MLP) and expectation-maximization classifier, selecting the classification technique that provides a high accuracy in computation of body contours of the second user type for computing an external body contour image of the second user type, and extracting one or more key points from the computed external body contour image of the second user type, and wherein the Graph Neural Network technique is implemented to process the extracted one or more key points for determining the body measurements of the second user type; and

render the generated garments on the generated 3D avatar of the second user type for carrying out a virtual try-on operation.

2. The system as claimed in claim 1, wherein the avatar generation engine comprises a garment generation unit executed by the processor and configured to apply machine learning and deep learning techniques for processing the inputs received from the first user type and generating the one or more garment type in the graphical format.

3. The system as claimed in claim 2, wherein the garment generation unit is configured to communicate with a database for storing the received inputs from the first user type and the generated one or more garment types in a data structure format, and wherein the generated garment types stored in the database are capable of being edited, the edits comprising change in measurements for garment type components, change in material for garment type components and tweaks in design of the garment type.

4. The system as claimed in claim 1, wherein the avatar generation engine comprises an avatar generation unit executed by the processor and is configured to render an interactive web application on the second input unit for capturing the first input type and the second input type via the second input unit, and wherein the avatar generation unit is configured to render the interactive web application on the second input unit for sending a request to the second user type for capturing the first input type and the second input type.

5. The system as claimed in claim 1, wherein the avatar of the second user type is generated in a semi-automatic manner in an offline mode.

6. The system as claimed in claim 1, wherein the measurements of the body specifications of the second user type comprises chest size, bust size, waist size, hip size, height, arm length and inseam length.

7. The system as claimed in claim 4, wherein the captured first input type is transmitted to the avatar generation unit by the second input unit using a 3D object management Application Programming Interface (API).

8. The system as claimed in claim 1, wherein the generation of the 3D avatar of the second user type in a semi automatic manner comprises the steps of:

invoking a database for fetching pre-stored one or more 3D body components models, subsequent to receiving the first input type from the second input unit, and wherein the body

components models comprises combination of a head model, an upper body model, a lower body model and an arm model;

transmitting the received first input type along with the fetched body components models in the form of a first request to a celery node unit of the avatar generation engine, wherein the first request is transmitted asynchronously to the celery node unit;

stitching together the received body components models, by the celery node unit, based on the first input type for generating the 3D avatar of the second user type by employing at least a blender technique, and wherein the celery node unit uses at least a node 1, a node 2 or a node 3 to stitch together the received body components models; and

sending an offline notification to the second user type for intimating the generation of the 3D avatar, and wherein the generated 3D avatar of the second user type is modifiable.

9. The system as claimed in claim 1, wherein the avatar generation engine comprises an avatar generation unit executed by the processor and configured to generate the 3D avatar of the second user type in an automatic manner by applying at least digital image processing techniques and deep learning techniques, and wherein the 3D avatar of the second user type is generated in the automatic manner in an online mode and in real-time.

10. The system as claimed in claim 1, wherein the captured one or more body images comprises a straight pose image, a side pose image and a face image of the second user type, and wherein the straight pose image comprises a front pose image and a back pose image of the second user type and the side pose image comprises a right side pose image and a left side pose image of the second user type.

11. The system as claimed in claim 1, wherein the avatar generation unit is trained prior to the computation of the body measurements of the second user type by applying the deep learning techniques, and wherein the training of the avatar generation unit is carried out using multiple datasets comprising sample sets related to multiple body measurements of the second user type, which are correlated with body images of the second user type, and wherein the body images are captured using at least the camera on the second input unit and from a video clip comprising the second user type, and wherein the body images are at least color images, gray scale images and of different skin types of the second user type.

12. The system as claimed in amened claim 11, wherein the generation of the 3D avatar of the second user type in the automatic manner by an avatar generation unit of the avatar generation engine comprises the steps of:

carrying out a segmentation operation to obtain the segmented output image by parallelly implementing the deep learning techniques on the second input type for computing body measurements of the second user type, wherein the segmentation operation partitions the image into multiple segments for determining objects in the image and locating boundaries, and wherein the segmentation operation comprises:

determining a densepose image in the form of a first mask image, wherein the densepose image is used to detect and identify the entire human body in the second input type;

processing a frontal pose image by using the deep learning techniques for placing markers around the body image associated with the second input type for determining the body region, wherein a Zhang-Suen thinning algorithm is used for placing markers around the body image associated with the second input type;

computing a classifier image as a second mask image using the determined body region by apply the deep learning techniques;

computing an external body contour image of the second user type by processing a segmented output image;

extracting one or more key points on the computed external body contour image, wherein the key points are extracted using at least one or more logic elements;

correlating the body images associated with the second input type using the second user type's height for accurately determining the body measurements of the second user type; and

carrying out an approximation operation on the determined body measurements for approximately computing the body measurements of the second user type;

transmitting the determined body measurements of the second user type to a celery node unit of the avatar generation engine along with a face image of the second user type, in the form of a second request, for generating a full body avatar of the second user type in a 3D format, the second request is transmitted asynchronously to the celery node unit; and

triggering an API on the second input unit for intimating the second user type on the generation of the full body avatar in 3D format by sending at least a notification on the

interactive web application or an SMS and an email along with a link of the full body avatar of the second user type.

13. The system as claimed in claim 12, wherein a capsule neural network (CapsNet) is implemented by the avatar generation unit for carrying out the segmentation operation and computing the body measurements of the second user type, and wherein the CapsNet architecture comprises two convolutional layers (Convl and Conv2) and one fully connected layer.

14. The system as claimed in claim 13, wherein implementation of the CapsNet for carrying out the segmentation operation and computing the body measurements of the second user type comprises the steps of:

inputting, to the CapsNet, an image of a dimension '512x512' (height (H) and width (W)) providing the determined body portion of the second user type;

passing the image to the Convl layer of the CapsNet, wherein the Convl is of a dimension '512x512x1x128', and wherein the Convl layer has 128, 9 x 9 convolution kernels with a stride of 1 and comprises a Rectified Linear Unit (ReLU) activation;

passing the output of the Convl layer as an input to the Conv2, wherein the Conv2 layer is of a dimension '512x512x1x128', and wherein the Conv2 layer has 128, 9 x 9 convolution kernels with the stride of 1 and comprises the ReLU activation;

selecting by the Convl layer and Conv2 layer a pixel size of the body image and running a window of a pre-determined size through the body image associated with the second input type, starting from left side and going to the right side of the image, pixel by pixel, which converts pixel intensities to the activities of local feature detectors, wherein running of window segments the body image into multiple small images which are combined together for determining an output image;

providing the output image from the Conv2 layer as an input to a primary capsule layer of a dimension '512x512x32x8';

providing an output from the primary capsule layer as an input to a segmentation capsule (SegCaps) layer, wherein the Segcaps layer is of a dimension '512x512x1x16';

processing by the SegCaps layer the received input and providing an output to a reconstruction convolution layer having a dimension of '512x512x128' for generating the second mask image; and

processing further by the SegCaps layer the received input image for computing length of one or more vectors associated with the received input image for providing a segmented output image having a dimension of '512x512' for determining body measurements of the second user type, and wherein a CapsNet loss function (l_k), associated with a Capsule k, is computed.

15. The system as claimed in claim 12, wherein processing of the second request by the celery node unit comprises the steps of:

selecting a pre-stored base model from one or more pre-stored base models which is a nearest neighbour of a measurement in a 90 degrees dimension space, wherein the base model is representative of a human body 3D model with pre-defined measurements;

applying at least a shrinking operation or an elongation operation on each measurement of the base model in accordance with the received body measurements of the second user type, wherein the celery node unit selects the closest base human body 3D model such that the shrinking or elongation of measurements is not visible in the rendered full body 3D avatar of the second user type;

using a ball tree data structure for efficiently computing the nearest neighbor in the 90 degrees dimension space for selecting the base model, wherein the ball tree structure provides determining the nearest human base model among the several base models based on determining the base models in the tree that are closest to a given base model by a distance metric, and wherein a Mahalanobis distance technique is implemented by the celery node unit as the distance metric for selecting the nearest base model from several base models;

generating the full body avatar of the second user type in the 3D format using at least a node 1, a node 2 or a node 3 based on the selected base model; and

transmitting the generated full body avatar of the second user type in the 3D format to the avatar generation unit, and wherein the avatar generation unit is configured to transmit the generated full body avatar of the second user type to the database using the 3D object management API for storage and future retrieval.

16. The system as claimed in claim 1, wherein the avatar generation engine comprises a virtual try-on unit executed by the processor and configured to fetch the generated garment types and the generated full body 3D avatar of the second user type from a database via a garment generation unit and an avatar generation unit of the avatar generation unit respectively, and wherein the virtual try-on unit is configured to render the fetched full body avatar of the second user type and the fetched garment types on an User Interface (UI) of the second input unit to the second user type and carry out the virtual try-on operation based on using at least a blender technique, and wherein the full body 3D avatar rendered with the garments is rotatable in a 360° angle view to visualize and compare the rendered garments from various angles.

17. The method as claimed in claim 1, wherein the generated garment types and the generated full body 3D avatar of the second user type are fetched, and wherein the fetched full body avatar of the second user type and the fetched garment types are rendered on an User Interface (UI) to the second user type and carry out the virtual try-on operation based on using at least a blender technique, and wherein the full body 3D avatar rendered with the garments is rotatable in a 360° angle view to visualize and compare the rendered garments from various angles.

18. A method for improved generation of 3D avatars for virtual try-on of garments, the method is implemented by a processor executing program instructions stored in a memory, the method comprising:

receiving inputs from a first user type, via a first input unit, for generating one or more garment types in a graphical format, wherein the inputs for generating the one or more garment types comprises a fully stitched garment image, a 2D flat image of the garment or a 3D sketch image of the garment;

generating a 3D avatar of a second user type by capturing a first input type or a second input type respectively received via a second input unit, wherein the first input type comprises measurements of body specifications of the second user type and the second input type comprises body images of the second user type captured from different angles via a camera present on the second input unit in a 2D format and received by employing a body measurement Application Programming Interface (API),

wherein the 3D avatar of the second user type is generated by parallelly implementing a combination of deep learning techniques including Convolutional Neural Network (CNN) technique, a Graph Neural Network technique and a Capsule Neural Network technique on the second input type, selecting the technique that provides a high accuracy for computing one or

more body measurements of the second user type to obtain a segmented output image, implementing a combination of classification techniques on the segmented output image including Bayesian, k-Nearest Neighbors (k-NN), Support Vector Machine (SVM), decision trees, adaptive boosting, random forest, Multilayer Perceptron (MLP) and expectation-maximization classifier, selecting the classification technique that provides a high accuracy in computation of body contours of the second user type for computing an external body contour image of the second user type, and extracting one or more key points from the computed external body contour image of the second user type, and wherein the Graph Neural Network technique is implemented to process the extracted one or more key points for determining the body measurements of the second user type; and

rendering the generated garments on the generated 3D avatar of the second user type for carrying out a virtual try-on operation.

19. The method as claimed in claim 18, wherein an interactive web application is rendered for capturing the first input type and the second input type, and wherein the interactive web application is rendered for sending a request to the second user type for capturing the first input type and the second input type.

20. The method as claimed in claim 18, wherein the measurements of the body specifications of the second user type comprises chest size, bust size, waist size, hip size, height, arm length and inseam length.

21. The method as claimed in claim 18, wherein the generation of the 3D avatar of a second user type in a semi-automatic manner comprises the steps of:

fetching pre-stored one or more 3D body components models, subsequent to receiving the first input type from the second input unit, and wherein the body components models comprises combination of a head model, an upper body model, a lower body model and an arm model;

transmitting the received first input type along with the fetched body components models in the form of a first request to a celery node unit, wherein the first request is transmitted asynchronously to the celery node unit;

stitching together the received body components models, by the celery node unit, based on the first input type for generating the 3D avatar of the second user type by employing at

least a blender technique; and wherein the celery node unit uses at least a node 1, a node 2 or a node 3 to stitch together the received body components models; and

sending an offline notification to the second user type for intimating the generation of the 3D avatar, and wherein the generated 3D avatar of the second user type is modifiable.

22. The method as claimed in claim 18, wherein the 3D avatar of the second user type is generate in the automatic manner by applying at least digital image processing techniques and deep learning techniques, and wherein the 3D avatar of the second user type is generated in the automatic manner in an online mode and in real-time.

23. The method as claimed in claim 18, wherein the captured one or more body images comprises straight pose image, a side pose image and a face image of the second user type, and wherein the straight pose image comprises a front pose image and a back pose image of the second user type and the side pose image comprises a right side pose image and a left side pose image of the second user type.

24. The method as claimed in claim 18, wherein the generation of the 3D avatar of a second user type in the automatic manner comprises the steps of:

carrying out a segmentation operation to obtain the segmented output image by parallelly implementing the deep learning techniques on the second input type for computing body measurements of the second user type, wherein the segmentation operation partitions the image into multiple segments for determining objects in the image and locating boundaries, and wherein the segmentation operation comprises:

determining a densepose image in the form of a first mask image, wherein the densepose image is used to detect and identify the entire human body in the second input type;

processing a frontal pose image by using the deep learning techniques for placing markers around the body image associated with the second input type for determining the body region, wherein a Zhang-Suen thinning algorithm is used for placing markers around the body image associated with the second input type;

computing a classifier image as a second mask image using the determined body region by apply the deep learning techniques;

computing an external body contour image of the second user type by processing a segmented output image;

extracting one or more key points on the computed external body contour image, wherein the key points are extracted using at least one or more logic elements;

correlating the body images associated with the second input type using the second user type's height for accurately determining the body measurements of the second user type; and

carrying out an approximation operation on the determined body measurements for approximately computing the body measurements of the second user type;

transmitting the determined body measurements of the second user type to a celery node unit along with a face image of the second user type, in the form of a second request, for generating a full body avatar of the second user type in a 3D format, the second request is transmitted asynchronously to the celery node unit; and

triggering an API for intimating the second user type on the generation of the full body avatar in 3D format by sending at least a notification on the interactive web application or an SMS and an email along with a link of the full body avatar of the second user type.

25. The method as claimed in claim 24, wherein a capsule neural network (CapsNet) is implemented for carrying out the segmentation operation and computing the body measurements of the second user type, and wherein the CapsNet architecture comprises two convolutional layers (Convl and Conv2) and one fully connected layer.

26. The method as claimed in claim 25, wherein the implementation of the CapsNet for carrying out the segmentation operation and computation of the body measurements of the second user type comprises the steps of:

inputting, to the CapsNet, an image of a dimension '512x512' (height (H) and width (W)) providing the determined body portion of the second user type;

passing the image to the Convl layer of the CapsNet, wherein the Convl is of a dimension '512x512x1x128', and wherein the Convl layer has 128, 9 x 9 convolution kernels with a stride of 1 and comprises a Rectified Linear Unit (ReLU) activation;

passing the output of the Convl layer as an input to the Conv2, wherein the Conv2 layer is of a dimension '512x512x1x128', and wherein the Conv2 layer has 128, 9 x 9 convolution kernels with the stride of 1 and comprises the ReLU activation;

selecting by the Convl layer and Conv2 layer, a pixel size of the body image and running a window of a pre-determined size through the body image associated with the second

input type, starting from left side and going to the right side of the image, pixel by pixel, which converts pixel intensities to the activities of local feature detectors, wherein running of window segments the body image into multiple small images, which are combined together for determining an output image;

providing the output image from the Conv2 layer as an input to a primary capsule layer of a dimension '512x512x32x8';

providing an output from the primary capsule layer as an input to a segmentation capsule (SegCaps) layer, wherein the Segcaps layer is of a dimension '512x512x1x16';

processing by the SegCaps layer, the received input and providing an output to a reconstruction convolution layer having a dimension of '512x512x128' for generating the second mask image; and

processing further by the SegCaps layer, the received input image for computing length of one or more vectors associated with the received input image for providing a segmented output image having a dimension of '512x512' for determining body measurements of the second user type, and wherein a CapsNet loss function (l_k), associated with a Capsule k, is computed.

27. The method as claimed in claim 24, wherein processing of the second request by the celery node unit comprises the steps of:

selecting a pre-stored base model from one or more pre-stored base models which is a nearest neighbor of a measurement in a 90 degrees dimension space, wherein the base model is representative of a human body 3D model with pre-defined measurements;

applying at least a shrinking operation or an elongation operation on each measurement of the base model in accordance with the received body measurements of the second user type, wherein the celery node unit selects the closest base human body 3D model such that the shrinking or elongation of measurements is not visible in the rendered full body 3D avatar of the second user type;

using a ball tree data structure for efficiently computing the nearest neighbor in the 90 degrees dimension space for selecting the base model, wherein the ball tree structure provides determining the nearest human base model among the several base models based on determining the base models in the tree that are closest to a given base model by a distance

metric, and wherein a Mahalanobis distance technique, as the distance metric, is implemented by the celery node unit for selecting the nearest base model from several base models;

generating the full body avatar of the second user type in the 3D format using at least a node 1, a node 2 or a node 3 based on the selected base model; and

transmitting the generated full body avatar of the second user type in the 3D format to an avatar generation unit, and wherein the avatar generation unit is configured to transmit the generated full body avatar of the second user type to the database using the 3D object management API for storage and future retrieval.

28. A computer program product comprising a non-transitory computer-readable medium having computer program code stored thereon, the computer-readable program code comprising instructions that, when executed by a processor, causes the processor to:

receive inputs from a first user type, via a first input unit, for generating one or more garment types in a graphical format, wherein the inputs for generating the one or more garment types comprises a fully stitched garment image, a 2D flat image of the garment or a 3D sketch image of the garment;

generate a 3D avatar of a second user type by capturing a first input type and a second input type respectively received via a second input unit, wherein the first input type comprises measurements of body specifications of the second user type and the second input type comprises body images of the second user type captured from different angles via a camera present on the second input unit in a 2D format and received based on employing a body measurement Application Programming Interface (API),

wherein the 3D avatar of the second user type is generated by parallelly implementing a combination of deep learning techniques including Convolutional Neural Network (CNN) technique, a Graph Neural Network technique and a Capsule Neural Network technique on the second input type, selecting the technique that provides a high accuracy for computing one or more body measurements of the second user type to obtain a segmented output image, implement a combination of classification techniques on the segmented output image including Bayesian, k-Nearest Neighbors (k-NN), Support Vector Machine (SVM), decision trees, adaptive boosting, random forest, Multilayer Perceptron (MLP) and expectation-maximization classifier, selecting the classification technique that provides a high accuracy in computation of body contours of the second user type for computing an external body contour image of the

second user type, and extracting one or more key points from the computed external body contour image of the second user type, and wherein the Graph Neural Network technique is implemented to process the extracted one or more key points for determining the body measurements of the second user type; and

render the generated garments on the generated 3D avatar of the second user type for carrying out a virtual try-on operation.