AFGHAN YOUTH FEMALES

MODEL DESCRIPTION DOCUMENT (MDD)

Version 1.0

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DOCUMENT REVISION HISTORY		
Version	**Description**	**Date**
0.1	Draft	01/07/15
1.0	Initial Release	09/11/15

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1   MODEL OVERVIEW

1.1   DESCRIPTION

This document details the 3-Dimensional (3D) models of Afghan Youth Female characters.   The Afghan Youth Female character models can be used with and without weapons and with a set of animations (see the specific weapons and animations Model Description Documents for more information). Weapons are attached and detached from the Afghan Youth Female character models at specific attach points. During runtime weapons are attached and detached to the model by the visualization system that controls the 3D model. These models can be used with any visualization system that can import FBX or COLLADA formats.

The Afghan Youth Female character models were developed by Dignitas Technologies for the SE Core DT Phase III Small Business Innovative Research (SBIR) project. The models are part of a larger set of character and weapon models, and animations developed to support the LVC-IA AAR 3D Viewer.   The models designs were based on screen captures of the CCTT DI Guy Afghan Youth Female models provided by SE Core. To meet the LVC-IA AAR performance requirement, a medium fidelity model was developed.

The Afghan Youth Female character model components include:
- Dress
- Pants
- Flats
- Hijab

1.2   REFERENCES

- 3D_Model_Development_Process.docx
  - The 3D model development process details Dignitas Technologies' procedure for building 3D characters and animations.
- Character_Model_Specification.docx
  - The character model specification provides the requirements for developing 3D character models and attachments.

<div align="center">

Afghan Youth Female 1   Afghan Youth Female 2   Afghan Youth Female 3

Figure 1 Afghan Youth Female Character Models

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1.3 MODEL VERSION

Information about the model version can be found in the "Model_Version.txt" file located in the model's directory (same directory the model's .fbx file is located).

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Table 1 Character Revision History

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Version	Description	Date
1.0	Initial release of the AfghanYouthFemale1_skelmesh.fbx	09/11/15
1.0	Initial release of the AfghanYouthFemale2_skelmesh.fbx	09/11/15
1.0	Initial release of the AfghanYouthFemale3_skelmesh.fbx	09/11/15

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1.4 MODEL SUMMARY

Table 2 Model Summary

Model Name	AfghanYouthFemale1_skelmesh.fbx AfghanYouthFemale2_skelmesh.fbx AfghanYouthFemale3_skelmesh.fbx
SE Core MEL Version L ID	860
Model Units	Meters
Model Height	1.73 Meters (units) or 173 Centimeters
Coordinate System	Cartesian X, Y, Z (see Figure 2 below)
Model Origin	Origin is located on the ground between the character's feet. (0, 0, 0) (*See figures 2-4 below*)
Model Orientation Runtime	Forward: Positive Y Up: Positive Z
Model Orientation Maya	Forward: Negative Z Up: Positive Y

Afghan Youth Female 1

Figure 2 Afghan Youth Female 1 Origin on Cartesian X, Y, Z Coordinate System

Afghan Youth Female 2

Figure 3 Afghan Youth Female 2 Origin on Cartesian X, Y, Z Coordinate System

Afghan Youth Female 3

Figure 4 Afghan Youth Female 3 Origin on Cartesian X, Y, Z Coordinate System

1.5   LICENSING/RIGHTS

Models built by Dignitas Technologies along with all files and documentation, have full Government Purpose Rights.

2   MODEL ATTRIBUTES

2.1   POLYGON ALLOCATION

Polygon allocation is the number of triangles and vertices for a given state and Level of Detail (LODs) in the model. The method for calculating the number of polygons is to gather each model state then count the polygons present in each representation. Animations are not included in the polygon allocation. The Afghan Youth Female (unarmed) character models have a single LOD which is labeled LOD0.

Table 3 Polygon Allocation

Model	# of Triangles	# of Vertices
Afghan Youth Female 1	3036	1552
Afghan Youth Female 2	3036	1552
Afghan Youth Female 3	3260	1692

2.2   LEVEL OF DETAIL (LODS)

Dignitas supports only one LOD (LOD0) and no switch distances at this time.

2.3   TEXTURE MAPS

Textures:

- AfghanYouthFemale1_COL.dds (Diffuse) 2048 x 2048 pixels
- Texture Version: 1.0

Figure 5 Afghan Youth Female 1 Texture Map

- AfghanYouthFemale1_NRML.dds (Normal map) 2048 x 2048 pixels
- Texture Version: 1.0

Figure 6 Afghan Youth Female 1 Normal Map

- AfghanYouthFemale2_COL.dds (Diffuse) 2048 x 2048 pixels
- Texture Version: 1.0

Figure 7 Afghan Youth Female 2 Texture Map

- AfghanYouthFemale2_NRML.dds (Normal map) 2048 x 2048 pixels
- Texture Version: 1.0

Figure 8 Afghan Youth Female 2 Normal Map

- AfghanYouthFemale3_COL.dds (Diffuse) 2048 x 2048 pixels
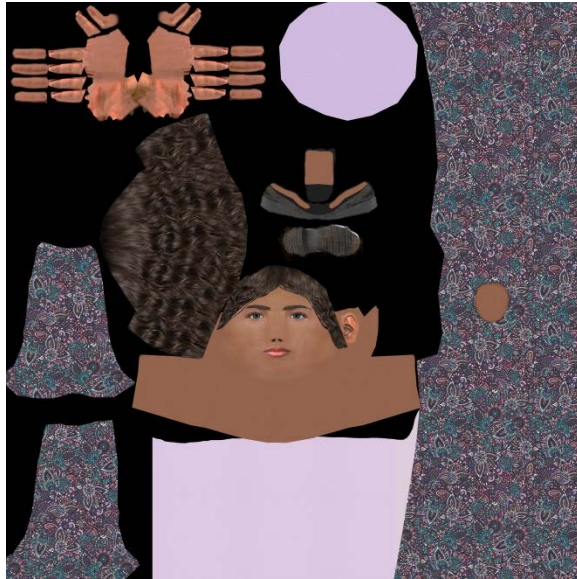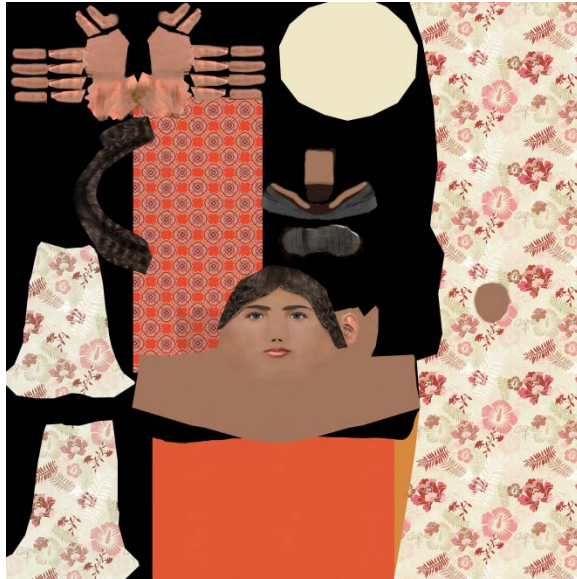- Texture Version: 1.0

Figure 9 Afghan Youth Female 3 Texture Map

- AfghanYouthFemale3_NRML.dds (Normal map) 2048 x 2048 pixels
- Texture Version: 1.0

Figure 10 Afghan Youth Female 3 Normal Map

2.4   SENSOR VIEWS

Not applicable at this time.

2.5   HEALTH STATES

For more information on the Incapacitated and Killed States refer to their respective MDDs.

Healthy State

Incapacitated State

Killed State

2.6   SKELETAL STRUCTURE

2.6.1   JOINTS IN THE RIG

A **rig** is a skeleton that attaches to the 3D model to allow for animations to be added. The **joints** in the rig hold the translation and rotational data from the animations.

Naming convention for joints:

Table 4 Naming Convention for Joints

Hips Spine Spine1 Neck Head HeadEnd LeftShoulder LeftArm LeftForeArm LeftHand LeftThumbBase LeftThumbTip LeftHandTip RightShoulder RightArm	RightForeArm RightHand RightThumbBase RightThumbTip RightHandTip LeftUpLeg LeftLeg LeftFoot LeftToeBase LeftToe RightUpLeg RightLeg RightFoot RightToeBase RightToe

2.6.2   ATTACH POINTS AND ATTACHED MODELS

The model rig and the **Attach Model** (e.g. weapons, cell phones, etc) both have **Attach Points** where they can be connected ("attached") during runtime.   **Attach Points** are unweighted joints on the model rig that represent locations where **Attach Models** can be connected. Attachments occur during runtime based on the animation applied to the model rig.   Table 5 lists all Attach Points, associated Attach Models, and corresponding animations for this character model.

Name of Attached Model	Animations	Attach Points
N/A	N/A	N/A

3   ANIMATIONS

The animations associated with this character are shown below. For additional animations compatible with this character, or more information on those listed above, please refer to the Animation MDDs.

- Walking
- Running
- Crawling
- Standing
- Kneeling
- Prone
- Incapacitated
- Crouching
- Killed

4   VERIFICATION APPROACH

4.1   RUNTIME SYSTEMS

This 3D model, associated accessories and weapons, and animations were tested using the following:

- Veritas 3D Viewer v1.13
- Veritas Model Viewer v1.4
- FBX Viewer 2013.3
- OneSAF v8.0

5   LIMITATIONS

Killed state is not implemented yet, however, it is under development.

6   CONTACT INFORMATION

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