

Table 1. Thirty-four landmarks used by 3D-ID. Abbreviations used in accompanying figures.		
Landmark	Abbrev	Definition
Left asterion	astl	Intersection of left parietal, left temporal, and occipital bones. If sutures are indistinct or include wormian bones, project suture lines until they intersect.
Right asterion	astr	Intersection of right parietal, right temporal, and occipital bones. If sutures are indistinct or include wormian bones, project suture lines until they intersect.
Basion	bas	The midline point of the anterior foramen magnum margin where it is intersected by the mid-sagittal plane. Directly opposite of the opisthion. In some cases, thickening of the 1 margin can make position location difficult to determine.
Bregma	brg	The midline point where the sagittal and coronal sutures intersect. In cases where the intersection is interrupted, such as with fontanelle bones, the suture lines are projected.
Left Dacryon	dacl	Left eye orbit: point on the medial border where the frontal, lacrimal, and maxilla bones meet, also noted as the intersection of the lacrimo-maxillary suture and frontal bone. A small foramen is often present.
Right Dacryon	dacr	Right eye orbit: point on the medial border where the frontal, lacrimal, and maxilla bones meet, also noted as the intersection of the lacrimo-maxillary suture and frontal bone. A small foramen is often present.
Left Ectomalare	ecml	Left maxilla: positioned at the most lateral point on the lateral surface of the alveolar crest. Found along the second molar on the maxilla.
Right Ectomalare	ecmr	Right maxilla: positioned at the most lateral point on the lateral surface of the alveolar crest. Found along the second molar on the maxilla.
Left Ectoconchion	ectl	Left eye orbit: intersection of the most anterior surface of lateral border and imaginary horizontal line bisecting the orbit.
Right Ectoconchion	ectr	Right eye orbit: intersection of the most anterior surface of lateral border and imaginary horizontal line bisecting the orbit.
Left Frontomalare Anterior	fmal	Left side of skull: most anterior projecting point on the frontomalare suture (different from the frontomalar orbitale and temporale).
Right Frontomalare Anterior	fmar	Right side of the skull: most anterior projecting point on the frontomalare suture (different from the frontomalare orbitale and temporale).
Left Frontomalare Temporale	fmtl	Left side of the skull: most lateral point on fronto-malare suture
Right Frontomalare Temporale	fmtr	Right side of the skull: most lateral point on fronto-malare suture
Glabella	glb	Most projecting midline point on the frontal bone above frontonasal suture. In juveniles with forward vaulted foreheads the most projecting point may not be the glabella.
Lambda	lam	Point where sagittal and lambdoidal sutures meet. If wormian bones are present, project the suture lines to their intersection point.
Left Mastoidale	mastl	Left mastoid process: point is located on the inferior end.
Right Mastoidale	mastr	Right mastoid process: point is located on the inferior end.

Nasion	nas	Midline intersection of the frontonasal suture and mid-sagittal plane.
Left Lower Orbital Border	obhi	Lower border of the left eye orbit: Measured as the maximum height from the upper to the lower orbital borders perpendicular to the horizontal axis of the <u>orbit</u> and using the middle of the inferior border as a fixed point
Right Lower Orbital Border	obhir	Lower border of the right eye orbit: Measured as the maximum height from the upper to the lower orbital borders perpendicular to the horizontal axis of the <u>orbit</u> and using the middle of the inferior border as a fixed point
Left Upper Orbital Border	obhs	Upper left eye orbit: Upper border of the left eye orbit: Measured as the maximum height from the upper to the lower orbital borders perpendicular to the horizontal axis of the <u>orbit</u> and using the middle of the inferior border as a fixed point
Right Upper Orbital Border	obhsr	Upper right eye orbit: Upper border of the right eye orbit: Measured as the maximum height from the upper to the lower orbital borders perpendicular to the horizontal axis of the <u>orbit</u> and using the middle of the inferior border as a fixed point
Opisthion	ops	Midline point of the posterior foramen magnum margin where the mid-sagittal plan intersects. Opposite of basion.
Prosthion-Howells estimated	pr / proHEST	Most anterior, midline point on the alveolar process of the maxilla between the central incisors.
Supspinale	ssp	The deepest point of the profile below the anterior nasal spine.
Left Nasomaxillary Suture Pinch	wnbl-simotic chord	Narrowest portion of the midline of the face to the left nasomaxillary suture. The minimum distance between wnbl-wnbr forms the simotic chord.
Right Nasomaxillary Suture Pinch	wnbr-simotic chord	Narrowest portion of the midline of the face to the right nasomaxillary suture. The minimum distance between wnbl-wnbr forms the simotic chord.
Left Zygion	zygl	Left zygomatic: most lateral point on the zygomatic arch. (Point is determined by measuring bizygomatic breadth)
Left Zygomaxillare	zygoml	Left side of skull: intersection of zygomaxillary suture and most medial masseter muscle attachment.
Right Zygomaxillare	zygomr	Right side of skull: intersection of zygomaxillary suture and most medial masseter muscle attachment.
Left Zygoorbitale	zygool	Left eye orbit: point of intersection between zygomaxillary suture and eye orbit.
Right Zygoorbitale	zygoor	Right eye orbit: point of intersection between zygomaxillary suture and orbit border.
Right Zygion	zygr	Right zygomatic: most lateral point on the zygomatic arch. (Point is determined by measuring bizygomatic breadth)