Title of research need: Development of 3D databases of human dentitions

Keyword(s): 3D scanning, dental population data, teeth

Submitting subcommittee(s): Odontology

Date Approved: 8/24/16

(If SAC review identifies additional subcommittees, add them to the box above.)

Background Information:

1. Description of research need:

Large 3D databases of human dentitions do not currently exist. Creation of these databases would provide researchers the ability to investigate variations of dental features. The databases can be used to create dental profiles. An individual’s profile can be assessed for relative similarity to other profiles in the databases. Direct comparisons between all profiles or individual profiles in the databases can establish and quantify similarities or differences. Specific profiles can be assessed for frequency of appearance in databases subdivided by sex, age, and ethnicity.

2. Key bibliographic references relating to this research need:


Thali et al. Bite Mark documentation and analysis: the forensic 3D/CAD supported photogrammetry approach. Forensic Science International 135 (2), 2003


3a. In what ways would the research results improve current laboratory capabilities?

Large 3D databases of dental features of human dentitions would enhance investigators’ capabilities for assessments and quantifications of the similarity or differences among human dentitions.

3b. In what ways would the research results improve understanding of the scientific basis for the subcommittee(s)?

Large 3D databases should enhance the scientific bases for human identifications and bitemark analyses by supplying qualitative and quantitative data analyses based on robust three dimensional population data.

3c. In what ways would the research results improve services to the criminal justice system?

Improved reliability and validity of comparisons and identifications.

4. Status assessment (I, II, III, or IV):  

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<thead>
<tr>
<th>Major gap in current knowledge</th>
<th>Minor gap in current knowledge</th>
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<tbody>
<tr>
<td>No or limited current research is being conducted</td>
<td>I</td>
</tr>
<tr>
<td>Existing current research is being conducted</td>
<td>II</td>
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This research need has been identified by one or more subcommittees of OSAC and is being provided as an informational resource to the community.

Approvals:

Subcommittee Approval date: 8-24-2016

(Approval is by majority vote of subcommittee. Once approved, forward to SAC.)
(Approval is by majority vote of SAC. Once approved, forward to NIST for posting.)