

AAO Foundation Award Final Report

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Secondary Investigators	
Award Type	Program Award
Project Title	Craniofacial imaging in the 21 st Century
Project Year	2002
Institution	University of Washington
Summary/Abstract (250 word maximum)	<p>a. Specific Aims (as originally proposed)</p> <p>The investigators propose to organize a series of biennial technology transfer symposium on cutting-edge topics in craniofacial health sciences. Each symposium will focus on a specific thematic area. The overall purpose of these symposia is to enhance advances in areas of great importance to craniofacial health care. The specific aims of this symposia series are: (1) Foster collaborative interactions among clinicians, educators and researchers from academics, industry and clinical practice. (2) Enhance transfer of novel technologies into clinical practice. (3) Provide academic and industry researchers insights into clinically relevant areas to focus future developments in technologies. Our inaugural symposium titled “Craniofacial Imaging in the 21st Century: New Approaches, Challenges and Applications” will be held from September 6 to 9, 2002 at Asilomar Conference Center in Pacific Grove, California. Because of the recent rapid advances in imaging technologies and their potential utility to craniofacial imaging, we believe that this topic is both relevant and timely. Our goal for the first symposium is to bring together experts in Craniofacial Imaging to present papers and posters, to participate in lectures and small group discussions and propose concepts that will help drive this field forward and toward increased clinical utility. The specific goals of this symposium are to:</p> <ol style="list-style-type: none"> 1. Disseminate information and discuss the current status of imaging specifically in the areas of (a) visualization including multi-dimensional imaging and anatomic reconstruction, (b) treatment and growth simulations and therapeutics including computer-assisted treatment and outcomes evaluation, and (c) implementation issues including interoperability, DICOM standards and IHE. 2. Identify, prioritize and discuss challenges related to clinical applications of novel and emerging craniofacial imaging technologies and develop clinical protocols that will optimally utilize these technologies. 3. Disseminate symposium presentations by publication of Proceedings. <p>b. Report of Symposium and Outcomes</p> <p>Our Inaugural Symposium on “Craniofacial Imaging in the 21st Century: New Approaches, Challenges and Applications” was held from September 6 to 9, 2002 at Asilomar Conference Center. The Program Planning Committee was comprised of Drs. Allan Farman, David Hatcher, Sunil Kapila, James Mah, Sharmila Majumdar and Michael Vannier. The publicity for the meeting included mailing of conference announcements, registration materials</p>

and abstract submission forms to targeted audiences in research societies, academic institutions and industry. Announcements were also placed in pertinent bulletins and on a website (www.coastorthodontics.org).

The speakers selected were from a broad spectrum of backgrounds including engineers, computer scientists, clinical researchers, surgeons, orthodontists and oral and general radiologists. Of the 29 speakers, 21 were from academic institutions, six from industry and two from private practice (see Onsite Program, Appendix I). Six keynote and 24 research oral presentations were made on the following topics: (1) Visualization that included multi-dimensional imaging and anatomic modeling. (2) Simulation and Therapeutics that included treatment simulations, virtual reality and computer assisted treatment. (3) Implementation issues including interoperability and medico-legal considerations.

A total of 221 individuals participated in the symposium. Of these 114 (51%) were academicians, 43 (19%) were from industry, 24 (11%) were from private practice and 40 (18%) were students or residents. The enthusiasm and interest of the participants in the presentations was reflected by the high level of attendance through the entire length of the meeting. Of the total 25 hours of the meeting, approximately 17 hours (68%) was dedicated to formal presentations, while eight hours (32%) was available for formal and informal discussions including poster sessions, panel discussions and breakout sessions.

Conference participants were surveyed on the final day of the meeting on a range of questions about the conference quality, content and location. The findings indicated that the scientific content and organization of the meeting received very good reviews. Additionally, a focus group comprising of 10 individuals were assembled during the meeting to discuss the evaluations, to highlight weaknesses and strengths of the first conference and to make recommendations for any modifications in the organization and logistics for subsequent symposia. The consensus was that the structure and content of the conference was optimal for realizing the objectives of the symposia series and in advancing the research and clinical utility of imaging craniofacial health care. Minor modifications including increasing the length of the talks and providing additional time for discussions and informal interactions were made and have been implemented in the second symposium. Moreover, several important recommendations in the areas of (1) contemporary research using novel craniofacial imaging technologies, (2) digital systems interoperability and (3) technology transfer (see pages 179-182 in the Proceedings in Appendix II) were made. Also, several outcome measures for the 2002 conference will be evaluated during the 2006 conference. These include enhanced clinical application of 3-D imaging, increased industry / academic collaborations, follow-up on actions taken on recommendations made in breakout sessions, and a formal survey of the utility and quality of the Proceedings.

Of the 29 manuscripts submitted for publication in the Proceedings, two were rejected, 16 were sent back to the authors for revisions and 11 were accepted with editorial changes. The

Proceedings (Appendix II) represents a comprehensive review of contemporary imaging methodologies and provides insights into future developments in this field. It is a good resource for researchers and clinicians working in this field. The Proceedings have been mailed to all subscribers of the journal, all dental schools in US and Canada and all meeting participants. Interested parties can also purchase the Proceedings by contacting relevant individuals listed on the website (www.coastorthodontics.org).

c. Significance

Radiologic and other methods of craniofacial imaging remain critical components of diagnosis and treatment planning in many clinical areas including orthodontics, oral medicine and pathology and surgery. Although great strides have been made in medical imaging, these have often not been applied to craniofacial imaging or applied to this field after a substantial time lag. The conference presented topics in a logical sequence from basic computational and technological advances to research applications in modeling to practical applications including in education and clinics. The knowledge gained by participants, while not quantitated by objective measures, likely enhanced their appreciation for novel imaging technologies and their research and clinical applications. Therefore, this conference may have helped to expedite the introduction of novel imaging technologies into craniofacial research and patient care. Indeed, several orthodontic programs and dental schools whose faculty participated in this conference have since acquired 3D cone beam CT systems for use in education, diagnosis and treatment planning. Also, the commercial introduction of at least one new cone beam computed tomography system, previously developed by an investigator through NIH SBIR grants, was facilitated by this conference (see letter, Appendix III).

d. Future Plans

On the basis of the success of our first symposium, our Conference Grant to NIDCR for partially funding the next three symposia over a period of 5 years was recently approved for funding. The second symposium on “Craniofacial Skeletal Bioengineering” will be held at Asilomar Conference Center from August 27 to 30, 2004. A broad spectrum of highly qualified speakers will present talks in areas ranging from cell signaling, mesenchymal stem cells, scaffolds, bioactive agents and bioreactors, clinical applications and commercialization of bioengineered tissues. Plans and topics for the 2006 and 2008 conferences will be discussed by the organizers during break times during the 2004 symposium.

e. Human Subjects: Not applicable

f. Publications: Proceedings of the Inaugural COAST Conference: Craniofacial Imaging in the 21st Century. Orthodontics and Craniofacial Research, 2003; 6, Suppl 1. Editors, Sunil Kapila and Allan Farman. Blackwell Munksgaard, Copenhagen, Denmark. (Appendix II).

g. Project Generated Resources: The Proceedings of the COAST Conference is a resource for investigators and clinicians using these technologies. (Appendix II).

h. Inventions and Patents: None

Were the original, specific aims of the proposal realized?	Yes
Were the results published? If not, are there plans to publish? If not, why not?	The proceedings of the 1 st conference on Advances in Orthodontic Science and Technology (COAST) was published in Orthodontics and Cranifacial Research. Vol. 6 (Suppl.1) 2003, Pages 1-182
Have the results of this proposal been presented? If so, when and where? If not, are there plans to do so? If not, why not?	Yes. At COAST 2002.