

PROGRESS REPORT DECEMBER 2014

ALTERNATE ANATOMIES LAB

The AAL became fully operational with the appointments at the beginning of this year of our two research fellows, Dr. Nina Sellars and Dr. Christian Kroos. AAL has now begun to function effectively as an interdisciplinary hub. This is due to-

1. The diverse expertise of our research group (art, performance, anatomy, robotics and cognitive science).
2. The active networking of our group, especially within Curtin University, but also through attendance and participation in interstate and international conferences and exhibitions.
3. Our state of the art equipment (the 16 micron resolution 3D printer, 3D scanners and 5K Cinema quality camera) have attracted collaborations with Computer Science, Engineering, Health Sciences, Medical Imaging Science and MCCA at Curtin University and with Symbiotica at UWA.

We are presently collaborating on projects with Dr. Lei Cui (Department of Mechanical Engineering), Assoc. Prof. Tele Tan and Dr. Raymond Sheh (Department of Computing), Dr. Zhonghua Sun (Medical Imaging Science) and Dr. Iain Murray (Department of Electrical and Computer Engineering).

We have 3D printed anatomical models for Zhonghua Sun and he is intending to have students working with us next year as he was impressed by the resolution of the printer to visualise pathologies in 3D anatomical prints.

We have also 3D printed a meteorite for Geoscience, Faculty of Science and Engineering.

STUDENT RESEARCH

The students who have completed projects with the AAL are-

Christiaan Gerritsen, *Avatar Installation* - MFA, SODA (completed)
Studio practice supervised by Stelarc

Warren Tarboten, *Robot Fish* - 4th Year Project (completed)
Supervisor Dr. Lei Cui

Alex Hayes, *Study of Tendon Under Load* - PhD Candidate Mechanical Engineering
Supervisors Prof. Brett Kirk and Dr. Ping Wu

Anthony Phan, *Hand Orthosis* - Mechanical Engineering
Supervisor Dr. Lei Cui

Hayden Gomer, *Accuracy of 3D Printing Repeatable Shapes* – Mechanical Engineering
Supervisor Dr. Nazrul Islam – Mechanical Engineering

OTHER COLLABORATIONS

1. Stelarc with Raymond Sheh from the Department of Computing, Intelligent Robots Group developed an interactive movement and sound performance with the Baxter robot which was a continuous 4 hour performance for *Robofair 2014*
2. AAL has also 3D printed components for projects for several international visiting artists doing their residencies at Symbiotica, UWA. Stelarc and AAL are prominently included in the present issue of *Artlink* on Bio Art.
3. A performance sound project with Nathan Thompson, a local musician, to engineer a novel, wearable spinal structure that generates sound through position, orientation and velocity of arm and body movements. A performance is planned early 2015.
4. In collaboration with Dr. Raymond Sheh and Dr. Christian Kroos, we are developing a flying quadcopter performance. Dr. Sheh's students spent a semester contributing to the project.
5. In collaboration with Robological, AAL is working on a Flying Head project. An embodied conversational agent that is a further iteration of the Prosthetic Head, the Articulated Head, the Floating Head and the Swarming Heads.
6. Christian Kroos, with Damith Herath (from Robological) are the co-organizers of the Robotics and Art Workshop as part of ICRA2014 conference on social robotics. Stelarc will be a keynote speaker and will also perform there.
7. Christian Kroos, Damith Herath and Stelarc are co-editing a book on *Robotics and Art* to be available in early 2015, published by Springer.

8. Stelarc visited Brunel University in November 2013 and in May 2014 to work on the Ambidextrous Arm project- a universal, human-like manipulator that is double-jointed, thus being left handed and right handed all in one. This is a collaboration between Design and Engineering at Brunel University London and AAL, School of Design and Art at Curtin University, Perth.
9. Stelarc, is assisting Sue Holben, a local resident with a tracheostomy device that will be more an aesthetic device than a medical aide. This is assisted by Adrian Reeve from Jewellery and several design students recommended by Andrew Goodlich.
10. Nina Sellars is collaborating with the Mexican artist Mayra Cano, who is the inaugural AAL 'artist in residence', to explore the affective dimension of medical rationality in relation to the contemporary notions of the body in Mexican culture.
11. Nina Sellars is collaborating with Dr. Anson Chau, Senior Lecturer in Medical Imaging, to explore the structural properties of fat and its visualization in medical imaging. Significantly, the research will address the need to interrogate our investment in the invisibility and visibility of fat, both in social and scientific contexts.

PROF. STELARC-

EXHIBITIONS AND PERFORMANCES

Muscles / Motors: Event for Body and Robot

Performance for Robofair, Curtin University, Perth.

30 November 2014

Spinning / Screaming: Event for Amplified Head

Performance for the Robotics and Art Workshop, International Conference
On Social Robotics, Powerhouse Museum, Sydney

28 October 2014

Microbot

Performances for Speculum Artium: The Shape of Things to Come
Devalski Dom Trebovlje & Ljubljana

3-4 September 2014-

Meat, Metal & Code

Retrospective exhibition - Laznia Museum of Art, Gdansk

15 May 2014

Less Talk, More Action

Performance, Westpace, Melbourne
5 December 2013

Festival of Ideas

Sculpture Installation: Ear On Arm - University of Melbourne, Parkville
1-6 October 2013

Super-Connect 2013 International Techno Art Exhibition

Installation: Internet Ear - National Taiwan Museum of Fine Art, Taichung
10 August – 27 October 2013

PRESENTATIONS

Design Studio 7 Unit Skype Presentation – Masters Program Applied Design in

Architecture, Oxford Brookes University, Oxford
2 December 2014

Clinical Research Presentation – Princess Margaret Hospital, Perth

1 December 2014

Biomimicry – Fremantle Art Centre

22 November 2014

CAEM Barcelona Skype

7 November 2014

TEDXVienna- Volkstheater, Vienna

1 November 2014

Robotics and Art Workshop- International Conference on Social Robots

Power House Museum, Sydney
28 October 2014

Creative Image Communication Class (CIC101) - Curtin University,

29 October 2014

Creative Image Communication Class (CIC101) - Curtin University,

18 September 2014

Vertical Engagements Architecture Lecture Series - Curtin University,

20 August 2014

Engineering & Health Sciences Research Workshop - Curtin University,
15 August 2014

Curtin Robotics Club / IEEE - Curtin University, 13 August 2014

IEEE Tech Fair - UWA, 13 August 2014

Interior Design Class - Curtin University, 4 August 2014

MIDAS (Methodological Innovation in Digital Arts and Social Sciences) - Brunel
University London 18 July 2014

Curtin Alumni Lecture Series - John Curtin Art Gallery, 3 July 2014

Central School of Speech and Drama - London, 21 May 2014

Architecture Association - London, 20 May 2014

Design Principles and Process Unit - Curtin University 1 April 2014

ASDI Biomicry – Curtin University 20 March 2014

Art and the Body in Performance- Wheeler Event, Melbourne, 18 March, 2014

Poetics of the Body Series, VCA Melbourne, 17 March, 2014

La Salle College - Singapore, 13 February 2014

Melbourne Now - NGV, Melbourne 4 January, 2014

Rites of Spring: 14th Humanities Research Conference - Curtin University
14, 15 November 2013

Het Nieuwe Instituut - Rotterdam, 24 October 2013

Mis En Scene - School of Arts, Brunel University London, 10 October 2013

Architecture and the Built Environment Lecture Series -
University of Westminster London, 3 October 2013

Museum of Contemporary Art Oaxaca (MACO) -
Oaxaca, 25 September 2013

Transitio 05 Biomediations - Mexico City, 22 September 2013

Poetics of the Body - VCA University of Melbourne, 2 September 2013

Visual Arts Lecture Series – Ormond College, University of Melbourne
30 August 2013

Research Seminar - Ormond College, University of Melbourne
29 August 2013

Super Connect 2013 International Techno Art Exhibition - National Taiwan Museum
of Fine Art Taiwan, 10 August 2013

CONFERENCES

Kiffy Rubbo Symposium - University of Melbourne, 29 - 30 August 2014

Vesalius Continuum - Zakynthos, 3-8 September 2014

3D Printing for Creative Industries - The Edge Brisbane, 11 July 2014

3D Printing Conference- Griffith University, 29 May, 2014

Driving Forces: The Role of Artists & Designers in Interdisciplinary Practice - ANU,
Canberra 27, 28 March 2014

Humanoids2013 - Atlanta, 15-17 October 2013

Model and Metaphor – University of Newcastle, 10 October 2013

Values, Vision & Transformation: Curtin Senior Leaders Conference -
Fremantle, 15-16 August 2013

WORKSHOPS

International Conference on Social Robotics- Robotics and Art
Powerhouse Museum, Sydney 28 October 2014

IEEE-RAS Response Robotics Summer School and Workshop -
Curtin University, 29-30 September 2014

Performance Workshop - La Salle College, 12 February 2014

Het Nieuwe Instituut Philosophy Workshop - Rotterdam 25 October 2014

ADDITIONAL ACTIVITIES

1. Stelarc featured on the *INSIGHT* program on *Cyborgs* which was screened on SBS on the 28 October.
2. Stelarc has been active in presenting his work and promoting AAL, both locally and internationally. See listing of activities below. He was also invited to do a TEDxVIENNA talk on 1 November, 2014.
3. Stelarc launched the ArtLink edition of BIOART and was a participant in the Panel Discussion at the Bird, Northbridge 19 September, 2014
4. AAL hosted Damith Herath, director of *Robological*, on a Curtin Visiting Fellowship for 2 weeks to work on the Robotics and Art publication, to organize the Robotics and Art Workshop and to initiate the *Flying Head* project.
5. We are presently working on designing and populating the AAL website by making it a student project in collaboration with Joel Louie from SODA. Several interested students submitted designs and the AAL chose Tim Gates to design and maintain the website.
6. Gave an extended interview for *FEED* on SBS on the 12 August which screened at 7:30 Tuesday 23 September 2014
7. RED 5K camera tutorial organized with Patrick O'Sullivan at Curtin at MCCA, Curtin University 26 June 2014
8. AAL Meeting and CAD demo organized at the Perth CAD Centre, Technology Park, Perth 17 June 2014
9. Filming of the Robot Fish project at the Koi Pond, Curtin University 12 June 2014
10. Assisted and loaned RED Camera and rig used for Cassandra Jordan's Honors Project film on the 10, 14, 17 June, 2014.
11. Stelarc participated in the Curtin University Open Day 2014 with a sound performance mixing the mechanical and pneumatic sounds of the arm with synthesized sounds from the controller.
12. Participated in the HIVE official opening by demonstrating the motion capture capabilities on the curved screen in 3D - 27 November 2013
13. Stelarc participated in RoboFair 2013, performing with his Extended Arm intermittently throughout the day.

PROGRESS REPORT

DR NINA SELLARS —AAL RESEARCH FELLOW

Research Interests

Critical debates around 'the posthuman'; electronic and digital art; relationship between media/cultural theory and media forms and practices; human dissection for medical display; anatomical imaging practice, historical and contemporary; sixteenth-century linear perspective and old master techniques for drawing the human figure; drawing and visual perception; photography, analogue and digital; the physics and history of optics; human interfaces with visual technologies, old and new.

AAL Research Outcomes

Refereed journal articles

1. Sellars, Nina. "The Optics of Anatomy and Light: A studio-based investigation of the construction of anatomical images" *Leonardo: the journal of the international society for the arts, sciences and technology*, Volume 47, Issue 6 (2014)
2. Sellars, Nina. "The Optics of Anatomy and Light" *Vesalius: Official journal of the international society for the history of medicine*, Volume XX, Number 1 (2014)

Other publications

3. Sellars, Nina. "Scan" *Photomediations Machine*, August 2013.
<http://photomediationsmachine.net>

Exhibitions and performances

4. Project Daejeon 2014: The Brain (2014-2015). Interactive art installation: "Scan". Daejeon Museum of Art, South Korea.
5. Fabrica Vitae (2014). Interactive artwork: "Encoding/Decoding the Body". Zakynthos Cultural Centre, Zakynthos, Greece.
6. Encyclopedia Galatica (2014). Interactive artwork: "Encoding/Decoding the Body". GV Art gallery, London, UK.
7. Biomediations: Transito-MX05 (2013). Interactive art installation: "Scan". Festival of New Media Art and Video in Mexico City. Centro Nacional De Las Artes, Mexico City, Mexico.

8. Biomediations: Transito-MX05 (2013). Performance: "Scan". Festival of New Media Art and Video in Mexico City. Laboratoria Arte Alameda, Mexico City, Mexico.
9. Biomediations: Transito-MX05 (2013). Performance: "Scan". Festival of New Media Art and Video in Mexico City. Centro Nacional De Las Artes, Mexico City, Mexico.
10. Dark Matter (2013). Performance: "Scan". Museum of Science and Industry, Manchester, UK.
11. Art & Science (2013). Interactive artwork: "Encoding/Decoding the Body". GV Art gallery, London, UK.
12. Brains: The Mind as Matter (2013). Interactive art installation: "Scan". Museum of Science and Industry, Manchester, UK. (Wellcome Trust, touring exhibition).

Conferences/Presentations

13. *Vesalius Continuum* Zakynthos Cultural Centre, Zakynthos, Greece, Sep 2014. (Travel funded by Oxford Brookes University)
14. *Driving Forces: The Role of Artists and Designers in Interdisciplinary Research*, Australian National University, School of Art, Canberra, Mar 2014. (Travel funded by The Australian National University)
15. *Biomediations: Transito_MX05*, Festival of New Media Art and Video in Mexico City, Sep 2013. (Travel funded by Transito_MX05)
16. *Dark Matter*, Museum of Science and Industry, Manchester, UK, Oct 2013. (Travel funded by a Public Engagement, Peoples Award, Wellcome Trust, UK)

Workshops

17. *NiteArt*. Anatomy/life-drawing lectures for citywide late-night art event. Harry Brookes Allen Museum of Anatomy and Pathology, Melbourne University, July 2014. (Travel funded by Melbourne University)
18. *Drawing Away the Skin/Revealing Hybrid Bodies*. A workshop designed for students of new media who are interested in the genealogy of anatomical imaging. *Biomediations: Transito_MX05*, Festival of New Media Art and Video in Mexico City, Sep 2013. (Travel funded by Transito_MX05)
19. *The Renaissance Anatomy Theatre: Cadavers, Candles and Chiaroscuro*. Anatomy drawing workshop that promotes an awareness of the historical context of contemporary anatomical imaging practices; placing particular emphasis on anatomy and light in their shared history of relational use. Wellcome Trust, London and Grant Museum, University College of London, May 2015. (*Forthcoming workshop for upcoming Wellcome event: 'On Light'.*)

20. *Anatomy for Artists*. Masterclass in traditional drawing techniques for representational figurative art, 2015. (*Forthcoming workshop, intended for School of Design and Art undergraduate students.*)

Awards/Recognition of Excellence

21. Leonardo: Journal of the International Society for the Arts, Sciences and Technology. The Leonardo Abstracts Peer Review Committee selected Sellars' PhD abstract as one of the highest ranking in the arts and sciences for 2014.

Citations of artwork

22. *Colliding Worlds: How Cutting-Edge Science is Redefining Contemporary Art* Arthur I. Miller (New York, NY: W.W. Norton & Company, 2014), pp. 191-200.

AAL Artist in Residence Program

23. Nina facilitated the first AAL artist in residence, working collaboratively with Mexican artist, Mayra Cano, from Universidad Nacional Autónoma de México. Mayra had attended Nina's 2013 workshop, *Drawing Away the Skin/Revealing Hybrid Bodies*, presented in Mexico as part of *Biomediations: Transito_05*, which is the largest new media festival in Latin America. Mayra was AAL artist in residence for 3 months, September – November 2014, funded by Universidad Nacional Autónoma de México. Through her arts practice, Mayra is working with Nina to explore the affective dimension of medical rationality in relation to the contemporary notions of the body in Mexican culture.

Promotional Video for Curtin Teaching & Learning Initiatives 2014

24. The online video presents Nina's research into alternatives and options for the implementation of a mixed reality, teaching space at Curtin University, which is uniquely defined and informed by arts practice.
<https://www.youtube.com/watch?v=FaKglJxUQIM>

Affiliations and Advisory Roles 2014

25. Nina holds a continuing Adjunct position in the Department of Anatomy & Developmental Biology, Monash University. The position, facilitated by Professor Paul McMenamin, Director of Centre of Human Anatomy Education, allows Nina to participate in McMenamin's world leading research &

development in the application of the 3D printed human cadaveric specimens for anatomy education.

26. *Photomediations Machine* Advisory Board Member. Curated by Professor Joanna Zylinska (Goldsmith University, London), and established in 2013, *Photomediations Machine* is an online space where the dynamic relations of mediation as performed in photography and other media can be encountered, experienced and engaged. *Photomediations Machine* is a sister project to the online open access, peer-reviewed journal *Culture Machine*, established in 1999.

Application for ARC funding as lead chief investigator 2015

27. *Reimagining Fat*. The research aims to investigate the changing status of fat in the enactment of anatomical knowledge and the implications of the perceptual change considered in broader social and cultural contexts. Significantly, the research will address the need to interrogate our investment in the invisibility and visibility of fat, both in our social and scientific realms. The research will produce an original contribution to knowledge through an interdisciplinary team of researchers, from the visual arts, humanities and medical and cognitive sciences, who will collaborate to develop new methodologies and critical discourses to engage with contemporary concepts of fat and its visualization.

Progress report - 22/09/2014

Dr Christian Kroos

Dr Christian Kroos joined the Alternate Anatomies Lab in 03/02/2014 as Research Fellow (fixed term contract 23 month).

Publications since start of work in AAL (including some in preparation but mostly at a fairly advanced state):

Books:

- Herath, D.C., Kroos, C., & Stelarc (Eds.) (in preparation). *Robotics and Art: An Unlikely Symbiosis*. Springer. [to appear in early 2015]
- Kroos, C. & Herath, D.C. (in preparation). *Research Methods in Human Robot Interaction*. Springer. [to appear in early 2016]

Book chapters:

- Kroos, C., Herath, D.C. (in preparation). Being one, being many. In: D.C. Herath, C. Kroos, & Stelarc (Eds.), *Robotics and Art: An Unlikely Symbiosis*. Springer.
- Kroos, C., Herath, D.C., & Stelarc. (in preparation). The Art in the Machine. In: D.C. Herath, C. Kroos, & Stelarc (Eds.), *Robotics and Art: An Unlikely Symbiosis*. Springer.

Peer reviewed journal articles:

- Bundgaard-Nielsen, R.L., Baker, B.J., Harvey, M., Best, C.T., & Kroos, C. (accepted). Native speech perception isn't perfect: Discrimination of multiple coronal stop contrasts in Wubuy (Australia). *PLOS ONE*.
- Quinto, L.R., Thompson, W.F., Kroos, C., & Palmer, C. (2014). Singing emotionally: A study of pre-production, production, and post-production facial expressions. *Frontiers in Psychology*, 5.

Peer reviewed conference proceedings:

- Kroos, C., Herath, D.C. (2014). We, Robots: Correlated Behaviour as Observed by Humans. In *Social Robotics*. Lecture Notes in Computer Science. Volume 8755. Springer Publishing, (pp 229-238).
- Kroos, C., Bundgaard-Nielsen, R.L., & Best, C.T. (2014). Exploring nonlinear relationships between speech face motion and tongue movements using Mutual Information. In: *International Speech Production Seminar 2014*. Köln, Germany.
- Best, C.T., Kroos, C., Bundgaard-Nielsen, R.L., Baker, B.J., Harvey, M., Tiede, M., & Goldstein, L. (2014). Articulatory basis of the apical/laminal distinction: Tongue tip/body coordination in the Wubuy 4-way coronal stop contrast. In: *International Speech Production Seminar 2014*. Köln, Germany.

HDR supervisions:

Fixed term contract too short for taking on M.A. or Ph.D. supervisions.

Grants:

Internal:

- Visiting Fellowship Scheme – granted (\$4760).
- Curtin Research Fellowship – unsuccessful.
- Application Small Research Grants (Miscellaneous) – granted (\$6000).

External:

- An ARC Linkage grant application between the AAL and industry partner [Robological](#) was submitted for the current round (projects starting 2015).

Title: 'Cloud-connected creative interfaces for the physical world'. CIs: Kroos, C., Stelarc. PI: Herath, D.C.

Robological is a start-up company in robotic and artificial intelligence research and development which has just been selected as one of the 23 most innovative tech start-ups nationwide by [Tech23](#).

- An ARC Discovery grant application is intended to be submitted in the next round. Title: 'Anthropomorphic Robotic Vocal Tract (ARVT)'. Draft proposal 70% finished. Lead CI: Kroos, C. Discussions with other CIs and PIs are currently underway.

Collaborations:

Internal:

- Dr Raymond Sheh, School of Electrical Engineering and Computing.
 - Collaboration on a robotic art project with Prof Stelarc.
 - Semester project with computer science students.

External:

- Robological (Sydney), Dr Damith Herath
 - Book projects
 - Journal article in preparation. Title: 'In search of ground truth in human-robot interaction'. Target journal: Journal of Social Robotics.
 - Conference presentation at ICSR 2014.
 - Workshop organisation at ICSR 2014.
 - Dr Damith Hearth visited the AAL for two weeks (07/09 – 20/09/2014) on invitation (Humanities Visiting Fellowship).
 - Linkage grant application submitted.
- University of Western Sydney, The MARCS Institute, Prof Cathi Best, and La Trobe University, Dr Rikke Bundgaard-Nielsen
 - Journal articles accepted and in preparation
 - Conference articles published and in preparation
- Macquarie University, Department of Psychology, Prof Bill Thompson and Dr Kim Curby
 - Journal article published.
 - Data processing ongoing for project including research partner at Vanderbilt University (USA).
- Sydney University, Jaw Function and Orofacial Pain Research Unit, Westmead Hospital Centre for Oral Health, Prof Greg Murray and Terry Whittle
 - Data processing for journal publication together with Prof Cathi Best, MARCS Institute (UWS), Prof Eric Vatikiotis-Bateson, University of British Columbia (Canada), and Dr Paul Tawadros, Australian Catholic University.

- Potential NHMRC grant proposal headed by Prof Greg Murray and administered by Sydney University with the same research partners as the intended journal article.

Workshop and talk series organisation:

- A full-day workshop '[Robots and Art – Misbehaving Machines](#)' at the International Conference on Social Robotics 2014 (Sydney) was held on 27/10/2014. Co-organisation with Dr Damith Herath from Robological.
- A talk series at AAL with monthly talks broadly related to the topics central to AAL was initiated under the title 'T@AAL '. The inaugural session took place on 15/09/2014 with a presentation by visiting researcher Dr. Damith Herath: 'Should Robots be Social?'