



RAPID PRODUCT DEVELOPMENT ASSOCIATION OF SOUTH AFRICA

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ASSOCIATION OF SOUTH AFRICA**

2022 CHAIRMAN'S REPORT

November 10th, 2022

**RAPDASA
Annual General Meeting**

**Lord Charles Hotel
Somerset West**

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1. Introduction

The Rapid Product Development Association of South Africa (RAPDASA) was formally founded at the First Annual General Meeting of the Association on 8 November 2000, at the CSIR International Conference Centre in Pretoria. This year marks the 23rd annual RAPDASA conference. It has been an exciting year for RAPDASA with many changes and new endeavours.

The RAPDASA conference has grown substantially over the last number of years and have partnered with RobMech (the Robotics and Mechatronics conference) and PRASA (the Pattern Recognition Association of South Africa). RAPDASA this year also partnered with the South African Advanced Materials Initiative (CoSAAMI).

The latest conference (called the RAPDASA-RobMech-PRASA-CoSAAMI 2022 Conference) was held at the Lord Charles hotel in Somerset West and hosted by the Stellenbosch University. The theme for the conference was *“Digital technology in production development”*.

This report will highlight some of the activities of the RAPDASA organisation for the year, it will provide feedback on the 2022 conference and conclude with some updates from AM service providers in South Africa.

2. RAPDASA Management Committee

The RAPDASA management committee for 2022 was elected during the Annual General Meeting held on 4 November 2021 at the CSIR International Conference Centre. Several members were also co-opted during the year to support the management committee. Members of the management committee were as follows:

- Marius Vermeulen (Chairperson)
- Ntombizodwa Mathe-Maleboho (Vice Chairperson)
- André van der Merwe (Conference Host)
- Pauline Bullock (Treasurer)
- Duncan William Gibbons (Finances - Co-opted)
- Jean-Pierre Serfontein (Marketing and Website)
- Lerato Tshabalala (Industry Workshops)
- Deon de Beer (Sponsorships)
- Imdaadulah Adam (Design Competition)
- Clive Hands (General)
- Willie du Preez (Conference Editor)
- Rynette Coetzer (Administration)
- Riaan Stopforth (Liaison - RobMech, PRASA)
- Miemie Maminza (Liaison – CoSAAMI)
- Zizo Gxowa-Penxa (Liaison – CoSAAMI)

RAPDASA management committee meetings were held on 26 November 2021, 25 February 2022, 27 May 2022, 19 August 2022, 7 October 2022, and 21 October 2022.

Executive committee meetings were held on 14 January 2022, 11 February 2022, 8 April 2022, 6 May 2022, 1 July 2022, 22 July 2022, and 23 September 2022.

3. 2022 Annual Conference

The RAPDASA conference has grown substantially over the last number of years and have partnered with RobMech (the Robotics and Mechatronics conference) and PRASA (the Pattern Recognition Association of South Africa). RAPDASA this year also partnered with the South African Advanced Materials Initiative (CoSAAMI). The theme for the conference was Digital technology in production development.

The conference was hosted by the Stellenbosch University at the Lord Charles Hotel in Somerset West.

The conference had a total of 241 delegates of which 204 was registered to attend in person and 37 for online participation. The 2 pre-conference seminars had a total of 114 delegates of which 110 attended in person while the rest was booked for online participation.

The main conference boasted a total of 98 presentations (of which 13 was keynote presentations), while an additional 8 presentations were presented in the industry track.

The pre-conference seminar on “design and additive manufacturing of titanium parts” had 8 technical presentations while 11 presentations were delivered at the seminar on “computational and data-driven modelling”.

90 full papers were accepted for publication after a double-blind peer review process, of which 7 papers were accepted for publication in the SA Journal of Industrial engineering and 83 papers in the conference proceedings. A further 6 extended abstracts were accepted for presentation in the conference without full papers. A poster session with 11 posters was also included.

I would like to extend a special thanks for our sponsors and exhibitors which continue to contribute to RAPDASA and without whom the conference would not be possible. The sponsors for this year’s conference are:

Platinum:

- CoSAAMI (through the Advanced Materials Initiative)
- Department of Science and Innovation (through the CPAM program)
- Vaal University of Technology

Silver:

- CRPM at the Central University of Technology
- PDTS at the Central University of Technology
- Rapid3D and EOS Electro Optical Systems GmbH

Bronze:

- Stellenbosch Technology Centre - Laboratory for Advanced Manufacturing

Over and above our sponsors, we also had the following exhibitors:

- 3D Wax Worx (Pty) Ltd
- Scientific & Precision Solutions
- Simutron (Pty) Ltd
- Stellenbosch Technology Centre (STC-LAM)
- TANDM Technologies (Pty) Ltd
- Weartech (Pty) Ltd
- Rapid3D and EOS Electro Optical Systems GmbH
- Vaal University of Technology (VUT)
- Product Development and Technology Station (CUT)
- Centre for Rapid Prototyping and Manufacturing (CUT)
- HH Industries
- Horne Technologies and Stelltron
- CoSAAMI
- SIMTEQ Engineering
- CSIR

I would also like to thank and congratulate André van der Merwe, the conference organiser, as well as his team for hosting the RAPDASA 2022 conference.

- Andre van der Merwe (Conference organiser)
- Thuli Mkhaliphi
- Noluthando Mthembu
- Faatiema Salie
- Mercia van der Merwe
- Rynette Coetzer
- Duncan Gibbons
- Daniel Kirkman
- Francois Du Rand

Finally, a special thanks to the following people who made a tremendous contribution to the conference.

- Willie du Preez, who is serving as the editor for RAPDASA and managed the academic side of the conference, including the paper review and publication processes.
- Rynette Coetzer for managing administration for RAPDASA as well as the annual conference.

4. Marketing and Electronic Media

RAPDASA has been running an ongoing social media marketing campaign throughout the year on Facebook, Instagram, and LinkedIn. Marketing activities were driven by Jean-Pierre Serfontein and outsourced to HH Industries.

During 2022, RAPDASA also established a YouTube channel with the intent on sharing key presentations to a wider audience. This process is driven by Duncan Gibbons.

5. Design Competition

Imdaadulah Adam was again responsible for the RAPDASA annual design competition. The theme for the 2022 competition was “Industrialization of 3D Printing”.

The competition expected entrants to design a multi-tool which can be applied to any industry and have a minimum of 3 tools all combined into a single multi-tool. Entrants were limited to design for any powder bed process, using only 1500mm³ of powder. Cash prizes to a total of R16 000 was sponsored by RAPDASA and, in addition, the winners' designs will be printed by the CRPM to scale using Nylon SLS.

This year's winners were as follows:

- 1st Bernard Brits - Multi BIT Keychain
- 2nd Alex Jablonski - Credit Card Multi Tool
- 3rd Buks Coetzer - MultiCariB

6. Dimitrov Scholarship

The Dimitrov Scholarship supported Ms Busisiwe Mfusi to attend the RAPDASA 2022 conference. Ms Mfusi is doing a Doctoral in Metallurgical Engineering through the Tshwane University of Technology.

7. Financials

RAPDASA currently has a healthy financial status as per treasurer's report. On behalf of RAPDASA, I want to thank our Treasurer, Pauline Bullock, for her tireless contributions in this regard.

8. Highlights of the South African AM industry for 2021

Upon creation of this report, AM service providers in South Africa were given an opportunity to report on major developments in their respective organisation during 2022. This section includes a summary (in no particular order) of responses received.

Multitrade 3D Systems and HH Industries

In February 2022, Multitrade 3D Systems installed a Concept Laser MLab 200R at Stellenbosch University's Industrial Engineering department. The installation and use forms part of an agreement with industry partner, HH Industries. The Concept Laser MLab 200R at Stellenbosch University is the only one of its specifications on the African continent and compliments the already established Additive Manufacturing facility at the department, which was co-established by the Technology Innovation Agency and the Department of Science and Innovation.

In May 2022, Multitrade 3D Systems announced that they had been appointed as the official sales partner for Meltio for sub-Saharan Africa and purchased the Meltio M450 Wire-Laser Metal Deposition machine as a demo, another first on the African continent. They have organised several events around the machine and the machine is now travelling around South Africa to show customers and educate people around the technology.

Rapid 3D

During 2022, HH Industries and Rapid 3D have been collaborating on a project to supply 3D printing equipment and services into Africa. Rapid 3D also Supplied several industrial hardware and software systems into South Africa and Africa in the 2022 financial year.

SIMTEQ Engineering

SIMTEQ Engineering's team of engineers developed a special "Additive Manufacturing and Generative Design Course". The course was developed for the additive manufacturing user community and is now available as an on-demand course presented by SIMTEQ.

MSC Software, now rebranded as Hexagon, also added several new developments and improvements to its simulation software and CAE technologies portfolio. This include MSC Apex Generative Design, Simufact Additive, Digimat and MaterialCentre. Hexagon also announced its collaboration with Microsoft to launch an online platform, Nexus, to connect engineers and manufacturers to streamline workflows in the factories of the future.

Vaal University of Technology

In 2022, VUT initiated upgrades to large sections of their facilities, including a new metal PBF facility. VUT already has a strong capability in rapid casting applications and will now extend their services to include metal additive manufacturing. The university will use this opportunity to offer Metal AM (MAM) design and manufacturing services to industry.

Aditiv Solutions

During 2022, Aditiv Solutions performed machine signoff with their first 2 clients for the locally designed and developed HYRAX metal powder bed fusion system. They completed the development of the “reactive” version of the HYRAX that allows for the production of aluminium and titanium parts. Orders have also been secured to deliver an additional three metal 3D printers in 2023 to South African clients.

Akhani3D

Akhani3D achieved ISO 9001:2015 certification in August 2022. They are reporting continued growth in the application of AM for production of parts in multiple sectors from Aerospace to IOT. They also implemented an AM focused MES system for improved production management and traceability.

Amnova Tech

Amnova Tech secured their first commercial large format industrial 3D Printing unit sale to a California, US based client as part of their pilot phase rollout of hybrid additive manufacturing technologies. Amnova is now focusing on the development of their next generation large format systems particularly targeting the automotive industry. Amnova will be opening a new production facility in 2023 as part of their production capacity expansion.

Centre for Rapid Prototyping and Manufacturing

CRPM received the Lithoz CeraFab Lab AM machine, which is a first for Africa. With the motto “In Africa – For Africa”, this printer will be used in medical device manufacturing and has been acquired by the DSI MedAdd project. As the first ceramic 3D printer installed in the entire African continent, this installation represents an important step forward in the growth of ceramic 3D printing as an established manufacturing technology in industry and healthcare. This ceramic 3D printer can

manufacture complex bio-scaffolds in hydroxy appetite, zirconium and tricalcium phosphate.

Product Development Technology station

The Product Development Technology Station (PDTS, funded by TIA), responsible for the assistive devices' product development in the MedAdd project, received ISO 9001 certification during Q4 2021 and successfully completed their first internal audit during Q1 2022. This ISO certification is an excellent milestone in the PDTS development history and will complement the CRPM's existing ISO 13485 certification to the benefit of MedAdd.

MedAdd

The Department of Higher Education, Science and Innovation officially launched the Medical Device Additive Manufacturing Technology Demonstrator Project (MedAdd) on 8 April 2022 at the Central University of Technology, Free State. The project has brought small businesses and the university's Centre for Rapid Prototyping and Manufacturing together to manufacture medical devices with the aim of reducing South Africa's reliance on costly imported medical devices that many hospitals cannot afford.

A good example of industry adoption is seen in the manufacturing of titanium 3D printed spinal cages. Since 2019, a total of 7835 units were manufactured by CRPM/MedAdd as part of a 317-product range among the 3 companies. This significant product range included a significant amount of research and development to optimise the design for AM (DfAM).

Stellenbosch University

The Stellenbosch Technology Centre - Laboratory for Advanced Manufacturing (STC-LAM) offers a wide range of additive manufacturing services on state-of-the-art equipment. We have capabilities for metal 3D printing in titanium alloy, maraging steel, stainless steel and tungsten carbide. We also offer high-quality 3D printing in multiple resins, polymers and filaments.

Photonics Center (CSIR - NLC)

The Photonics Center is the host of the Aeroswift program, currently focussed on the commercialisation of High-Power Selective Laser Melting. The Centre also hosts the CPAM program that supports research and development for the full value chain of additive manufacturing. The Centre recently posted an Expression of Interest for the "transfer in pre-production of metal additive manufacturing platforms". The aim of this EoI is to:

- identify local industrial partners who are interested in supporting the development of an industrial high-power metal AM machine to the point of manufacturability,
- support the development of the production systems needed to produce the industrial machine reliably and
- commercialization of the outputs.

Electra Mining Africa 2022

Five companies who have all exhibited at RAPDASA previously had stands at the 2022 Electra Mining expo in Johannesburg. With more than 30 000 people attending the expo, the local additive manufacturing industry got some great exposure.

9. Conclusion

Based on the 2022 conference, the additive manufacturing space in South Africa seem healthy and growing in both the academic and industry sectors.

Our network has grown substantially over the last number of years with the inclusion of RobMech, PRASA and CoSAAMI in our network. These collaborations are having an affect on the format of the annual conference and we have seen a substantial increase in attendance and technical papers. These changes will surely have an impact on RAPDASA processes and it is expected that some exciting changes will need to be considered by future management committees.

I would like to thank the RAPDASA management committee for your tireless efforts and support during the year.

Finally, I would like to thank the conference organisers again for orchestrating an excellent event in a beautiful location. It has not been achieved without hard work and dedication and your efforts are noticed and appreciated.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Marius Vermeulen', with a long horizontal line extending to the right.

Marius Vermeulen
(Chairman)