Projects & Partnerships



Cast Analytics

Carl Reilly, PhD CEO carl.reilly@castanalytics.ca

Empower Operations Gary Wang, PhD CEO gary.wang@empowerops.com

Next Generation Manufacturing Canada

Overview of Companies Cast Analytics

Location: Vancouver, BC Background: UBC Spin-off

Focus: Improving manufacturing processes

- Application of computational tools
- Strong emphasis on understanding and quantitative validation



Location: Surrey, BC Background: SFU Spin-off

Focus: Improving process & product design through AI-driven optimization algorithms

Software: OASIS

- Adopted by Fortune 500 companies
- Can be coupled to commercial software packages or in-house codes

Close connections to UBC and SFU could be utilized if appropriate





Empower Operations / Cast Analytics Gary Wang / Carl Reilly

TECHNOLOGY OVERVIEW

Prior Project: Optimization of the aluminum car wheel manufacturing process

Optimizer

Focus: Cycle time reduction (increase productivity) Quality improvement (reduced scrap)

Process Parameters: Cooling timings Cycle time

Assessment Criteria:

- Constraints
- Performance metrics

Optimum Assessment Process Viable? Optimum?





Empower Operations / Cast Analytics Gary Wang / Carl Reilly

Al-Driven Optimization of Near Net Shape Manufacturing Process

BACKGROUND

- Project scope currently loosely defined, dependent on project team
 - Open to discussion
 - Multiple ideas
 - Define mutually beneficial project when team determined
- Key areas of interest for Cast Analytics and Empower Operations:
 - Digital Twin for manufacturing processes
 - Al-driven optimization
 - Custom software solution





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Empower Operations / Cast Analytics Gary Wang / Carl Reilly

PROJECT **PROJECT DESCRIPTION:** DURATION: For a manufacturing process, via the use of; Digital Twin, optimization & software tools: 12-24 months Undertake development in a virtual environment (Digital Twin) Define key process parameters via AI-driven optimization STARTING Create custom software tools MRL LEVEL: **PROJECT OBJECTIVES:** Reduction in process development time and cost ENDING Increase productivity MRL LEVEL: Improve product quality Reduce/remove reliance on experience and trial and error methodologies • Create software tools for efficient future application of technologies



Empower Operations / Cast Analytics Gary Wang / Carl Reilly

OUR EXPERTISE AND ROLE IN THE PROJECT:

- Developing validated Digital Twins
- Optimization algorithms and Al
- Software development

EXPERTISE WE ARE SEEKING:

- Manufactures in plastics/ metals industries (e.g. injection molding, casting)
 - Preferably medium to high volume
- Desire to improve one or more of: quality, productivity, development process
- CAE software tool providers



Cast Analytics

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Next Generation Manufacturing Canada

Solar Earth Technologies

Dr. Michael Whitwick, CTO michael.Whitwick@solarearth.ca (+1) 779-899-5788



solearth

Solar Earth at a Glance

We produce **Solar Modules** robust enough to be a **Road**

- Allows land-intensive solar power in tight spaces
- Enables infrastructure to be more than sunk costs
- Unique solution to;

solearth

N®en

- Weather resilient solar power generation,
- Integrating with IoT and lighting solutions
- Supplementing grids with distributed power
- Developed with 3 years of in-the-ground testing and 8 successful pilots
- Early stage; initial sales and building manufacture pipeline







Solar Earth Technologies Dr. Michael Whitwick, CTO

PROJECT DESCRIPTION:

As the demand for Solar Roads increases, Solar Earth Technologies is increasing it's manufacturing capacity. Particularly, constructing Canada-based facilities to directly serve the North American markets. Solar Earth's current facilities have production capabilities of a ~ 150 m² per year (a few kW per year), minor method improvement are to be implemented on scale-up

PROJECT OBJECTIVES:

- Establish of a Solar Roads module production plant in BC
- Establish stable process on scale-up. Reduce manufacture cost per unit ~85%, yield rate >95%
- Yield module production capacity of 7500 m² per year (1MW per year).

DURATION: 12 months STARTING MRL LEVEL: 7

PROJECT









Solar Earth Technologies Dr. Michael Whitwick, CTO

OUR EXPERTISE AND ROLE IN THE PROJECT:

- Solar Road Module technology chain and manufacture methods
 - Solar cell wiring and assemble
 - Encapsulation & protection
 - Traction enhancing anti-skid production
 - Variety of supporting base layers

EXPERTISE WE ARE SEEKING:

- Laminated polymer production capability
- North America supply chain support
- Strategic Partners



Solar Earth Technologies

Dr. Michael Whitwick, CTO michael.Whitwick@solarearth.ca (+1) 779-899-5788



solearth

Virtro

Lee Brighton President lee@virtro.ca





Company overview



- Start-up with team of 27 people (diverse and inclusive)
- Core technology: VR, AI NLP.





Virtro - www.virtro.ca Lee Brighton, President

PROJECT DESCRIPTION

• VR Training Simulation framework to demonstrate core competency through an Evidence-based Evaluation and metrics that consider verbal and action based situational learning.

PROJECT OBJECTIVES

- Develop training simulation for required core competencies.
- Increase speed of learning and understanding of tasks through immersive VR
- Increase knowledge retention using Virtual Humans to provide higher engagement
- Provide inclusive learning for newcomers regardless of language level.

DURATION: 24 months STARTING MRL LEVEL: 6

PROJECT







Virtro - www.virtro.ca Lee Brighton, President

OUR EXPERTISE AND ROLE IN THE PROJECT:

- VR training simulations and experiences
- Evidence-based Evaluation (Voice and action)
- Inclusive training for proficient English speakers and language learners

EXPERTISE WE ARE SEEKING:

- Manufacturer with training programs that could be on demand, on location or scale for warehouse, factory, leadership or safety.
- Learning and Development team to collaborate on the learning content in order to produce accurate training simulations and evidence based evaluation of competency.



Virtro

Lee Brighton President lee@virtro.ca







Nova-BioRubber Green Technologies Inc

Dr. Anvar Buranov President/CEO Email: info@novabiorubber.com







Nova-Biorubber Green Technologies Inc Dr. Anvar Buranov, President/CEO

- Strategic products: 1) hypoallergenic latex, 2) biorubber & 3) inulin from Taraxacum koksaghyz (TKS) to solve latex allergy, obesity issues & to satisfy rubber shortage.
- Patented green process provides significant savings in processing costs.
- Moderate climate Pacific Northwest is ideal
 Taraxacum kok-saghyz (TKS) or Rubber plant

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Crop value: \$31K/acre



Founded in 2009 in Penticton, British Columbia.





Nova-Biorubber Green Technologies Inc Dr. Anvar Buranov, President/CEO

PROJECT DESCRIPTION:

Sustainable and hypoallergenic bioproducts such as biolatex, biorubber and inulin from annual rubber plant rubber plant that takes only 4 months to grow in North America. TKS contains 24% rubber and 40 % inulin in its roots.

PROJECT OBJECTIVES:

- Grow annual rubber plant on 1,000 acres
- Build processing facility with 100 tons of biolatex/biorubber and 100 tons of inulin
- Manufacture hypoallergenic medical gloves
- Production of proteins

PROJECT DURATION: 24 months

STARTING TRL LEVEL: 6









Nova-Biorubber Green Technologies Inc Dr. Anvar Buranov, President/CEO

OUR EXPERTISE AND ROLE IN THE PROJECT:

- Dr. Anvar Buranov, MSc, PhD, Postdoc. 15 publications. Managed several government funded projects. 18 years of experience.
- Mr. Jeff Martin, MSc, MBA. 22 years of innovation experience. Worked for Kimberly Clark and Yulex Corporation
- Mr. Jason Rite, MBA. 34 years of management experience with Nitrolube Canada.

EXPERTISE WE ARE SEEKING:

- Seeking CEO. Experience in Agriculture and Processing are required.
- Seeking chemical engineer
- Seeking farmers for partnership
- Seeking investors





Nova-BioRubber Green Technologies Inc

Dr. Anvar Buranov President/CEO Email: info@novabiorubber.com



Leichtbau BW

Dr. Wolfgang Seeliger Managing Director





Less is more. Added Value.

Leichtbau BW and Lightweight Technology from Baden-Württemberg Surrey, 29th January 2020



Objectives of Leichtbau BW

Leichtbau BW is an economic development corporation to promote industrial relations and technological innovation









We represent a network of more than 2,200 companies and 300 research institutions, catering for every need in the lightweight technology sector.





TraCLight – Transatlantic Cluster for Lightweighting

Addressing Global Challenges through Collaboration

What is TraCLight?





Bring together technical know-how for the development of truly unique and innovative lightweighting products through collaborative R&D



1st Project

ARENA2036

ARENA2036

Project Description – ARENA2036

Who we are

Describtion

- ARENA2036 is a Research Campus in Stuttgart
- ARENA2036 pools the competencies of 40+ partners from industry and science
- Focus areas: 5G, IoT, Fluid Production, Additive Manufacturing,...
- The aim of ARENA2036 is to produce potentially disruptive innovations based on excellent, interdisciplinary basic and applied research.
- The direct transfer of research results into industrial application is intended to increase the competitiveness of Germany.

What we can offer

Potential Partners

- This project will develop high-performance, fiber reinforced, thermoplastic products by reusing factory waste.
- Key aspects of this topic are the manufacturing of complex structural parts via injection molding and/or additive manufacturing and the joining with structural CFRTP-parts.
- Mechanical properties (e.g. fiber orientation, tensile strength) will be simulated and validated by CT and mechanical testing.
- This project will show that recycled reinforced thermoplastics can be used for high quality structural parts and thus result in decreased use of natural resources



What we are looking for

Potential Partners

- Thermoplastic material supplier
- Additive manufacturing and/or injection molding
- Thermoplastic joining (ultrasonic welding)
- Thermoplastic composites manufacturing

Requirements

- Supply of recycled thermoplastic material
- Manufacturing of fiber reinforced thermoplastic structural parts
- Joining of recycled parts by additive manufacturing or injection molding with structural CFRTP-parts



2nd Project





Project Description – German Institutes of Textile and Fiber Research (DITF)





3rd Project





Project Description – Rosswag GmbH

Who we are

Describtion

- The family-run Rosswag GmbH was founded in 1911 and is a leading supplier of open-die forging components.
- In 2014, the division Rosswag Engineering was founded with a special focus on the production of high quality AM parts in a holistic process chain and the rapid qualification of new metal materials for AM applications.
- More than 400 different metal alloys available in stock for raw material production

What we can offer

Potential Partners

- Development and qualification of new materials for the LPBF-Process for applications in the area of high strength tool steel alloys or high temperature and high pressure conditions, such as heat exchangers.
- Rosswag can provide the raw material (powder) and can conduct the AM-parameter studies as well as the following microstructure and mechanical testing via an in-house process chain.



What we are looking for

Potential Partners

- End User: Demand for new materials e.g. in the area of high strength tool steels for their products i.e. cutting or forming tools or high temperature materials (Ni/Fe based).
- Institutes: Material science capabilities to create new AM alloy compositions, fitting the end user specifications



4th Project





Project Description – Intec International GmbH

Who we are

Describtion

- INTEC International GmbH is a crossindustry consulting and system house.
- They not only develop innovative solutions for companies of different sizes, but also accompanies them from strategic consulting to customer-specific adaptation to implementation, operation and maintenance of technology platforms and applications across the spectrum of information technology.
- This includes complete infrastructure solutions as well as the execution of individual and sub-projects in corporate IT.

What we can offer

Potential Partners

- The MEP®ServiceBox is an embedded industrial PC, which is available with different package sizes and performance levels. It is an interface between machine and software.
- It can be extended individually to various interfaces.
- Possible connections are PROFIbus, CAN, Interbus, Modbus, analog and digital I/O ports, among others.
- In addition, the larger version also allows the installation of 2.5" HDDs or SSDs for bigger storage capacities.





What we are looking for

Potential Partners

- Companies from mechanical and plant engineering, automotive, energy and public sector and financial industries
- Universities or institutes for developing new algorithm for the MEP® ServiceBox



Thank you.

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Leichtbau BW

Dr. Wolfgang Seeliger Managing Director



Tell us how we can support your transformation.

project@ngen.ca

capacity@ngen.ca



