Jose T. Gonsalves

josetg@vt.edu

EDUCATION

MSc. Mechanical Engineering
Cumulative GPA: 3.90 / 4.0
(*PhD candidate from April 2023 – **incomplete***)
University of British Columbia (UBC)
Vancouver, British Columbia, Canada
Class of 2023

B.S. Aerospace and Ocean Engineering Double Major
Minor: Naval Engineering
Cumulative GPA: 3.85 / 4.0 *(Summa Cum Laude)*
Class Rank: 7 / 137
Virginia Tech (VT)
Blacksburg, Virginia, USA
Class of 2016

RESEARCH EXPERIENCE

UBC Computational Multiphysics Laboratory (CML) *Fall 2020 – April 2024*
Graduate Research Assistant – Dr. Rajeev Jaiman

- Developed a robust and efficient quasi-Newton coupling algorithm to stabilize and accelerate the iterative convergence of (partitioned) low mass-ratio fluid-structure interaction (FSI) simulations based on an adaptively regularized Anderson Acceleration and eigenmode filtering strategy. Integrated these algorithms (and additional tools) into the lab's MPI parallelized HPC research code base.
- Developed from scratch my own suite of OpenMP parallelized 2/3D high-fidelity FSI software packages in MATLAB (w/ mexified C++ files) to investigate the numerical properties of partitioned multiphysics simulations (high-order temporal integration and FE-DG discretization schemes, conservative interfacial data mapping techniques, adaptive mesh refinement and domain decomposition).
- As a working group member of the Intelligent and Green Marine Vessels (IGMVs) project, I supported the data analysis of ongoing (numerical and empirical) investigations into the use of structural flexibility to control ship radiated propeller noise through the intentional manipulation of cavitation and vortex shedding frequencies.
- Successfully completed 6 courses in SHARCNET's Summer School on Advanced Research Computing (ARC) focusing on parallel programming, debugging, and profiling with C++, modern Fortran, MPI, and CUDA all in high-performance computing environments.

Virginia Tech Experimental Aero/Hydroacoustics Laboratory *Spring 2016*
Undergraduate Researcher- Dr. William Alexander

- Designed and conducted a set of experiments using the Anechoic Wall-Jet Wind Tunnel to characterize the unsteady aerodynamic properties of near-wall flows over canopy shrouded surfaces as part of a larger effort to understand roughness noise suppression.
- Generated, reduced, and analyzed over 100 GB of raw data, summarizing my research via a concise report and thorough logbooks.

Conference Proceedings

- 74th American Physic Society – Division of Fluid Dynamics — Anderson-Type Mixing for the Convergence Acceleration of Partitioned Fluid-Structure Interaction (FSI) Algorithms — *November 21st -23rd, 2021*

TEACHING EXPERIENCE

University of British Columbia, Vancouver, Canada.
(Lead) Teaching Assistant*

- PHYS 159 - Physics Laboratory for Engineers — *Spring 2023*
- STAT 200 - Elementary Statistics for Applications — *Spring 2021 & 2022*
- STAT 305 - Introduction to Statistical Inference — *Summer II 2021*
- MECH 325 - Machine Design: Design with Mechanical Components* — *Fall 2021, 2022 & 2023*

ACADEMIC HONORS & AWARDS

- **The Gartshore Fellowship**, UBC Mechanical Engineering Department, April 2020
- **The Chester L. Long Graduate Scholarship**, The Society of Naval Architects and Marine Engineers (SNAME), April 2020
- 1st Place AOE Department Senior Design Competition, Virginia Tech, May 2016
- Valedictorian - Class of 2011, Our Lady of Fatima College, May 2011

RESEARCH SOFTWARE SKILLS

- Simulink / LabVIEW
- MATLAB / Mathematica
- TensorFlow
- Parallel Studio XE, Open MPI, OpenMP, CUDA
- FEniCS
- Calculix /Abaqus
- deal.ii
- OpenFOAM, foam-extend, SU2
- Programming Languages: C++, Fortran, Python, R, Julia, VBA
- Pre/Post-Proc: GMSH, Paraview, Tecplot, GiD
- Multiphysics Packages: SimFlow, Kratos, Comsol, preCICE, CoCoNuT

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EMPLOYMENT EXPERIENCE

NETSCo. Inc., Cleveland, Ohio. *May 2017 – August 2019*

Junior Naval Architect and Marine Engineer

- Developed GLMs for bulk carrier loading ops and analyzed multi-body interactions during dry-dockings and load-offs using GHS.
- Developed conversion concepts through to regulatory type approval (synthesizing class rules, generating renderings, performing calcs, projecting feasibility, producing drawings and arrangements), including an OSV to both an LNG Tanker and a WT Installation Vessel.
- Lead NETSCo's engineering, coordination, technology development, and patent filing efforts in tandem with various industry partners (owners, operators, scientist, regulatory bodies, and community representatives) to bring a feasible BWMS to the Great Lakes.
- Performed structural analysis studies using FEMAP/Creo Simulate and ATB configuration optimization studies using Ansys Fluent.

MiNO Marine, LLC, New Orleans, Louisiana. *October 2016 - May 2017*

Naval Architect Intern

- Designed a basic-shape liftboat and performed wind effect calcs (heeling arm plots, polar plots) for jack-up and lifting operations.
- Modeled a 40' steam-powered yacht in Rhino from a drone's photogrammetric point cloud to aid in subsequent restoration services.
- Developed spreadsheets for; EPLA, preliminary weight estimating, vessel loading and, operational conditions and stability analyses.
- Supported the development of CAD drawings, Ops. Manuals, Subchpt. M compliance docs, Dry docking pre-award calculations, etc.

Tsunami Marine Ltd., Port of Spain, Trinidad. *Summer 2013, 2014, 2015*

Naval Architect Intern and Extern

- Participated in 3 ISM Code and SMS workshops and assisted in CMID and OVID Audits onboard 12 offshore supply vessels.
- Created hull models and arrangements from measured offsets and performed stability calculations and structural integrity analyses.
- Audited FSS and drafted Fire Control Plans for over 15 vessels of varying classification generating over $10,000 in company revenue.
- Performed detailed fire damage inspections, operations audits, cost estimates and reconstruction recommendations for 4 gutted ships, summarizing them into technical reports on behalf of vessel owners/operators to be used for insurance claims upward of $1.2M.

Housing and Residence Life of Virginia Tech, Blacksburg, Virginia. *Spring 2015 - Spring 2016*

Residential Adviser

- Lived among, oversaw, lead, and provided a direct resource to 38 unique and diverse undergraduate students.
- Enforced university regulations within a 1000+ student community resulting in a safe, enjoyable, and educational living environment.
- Engaged in community development through; weekly structured staff meetings, team building exercises, personal and academic counseling, curriculum development, documenting community issues and student misconduct, and group community service projects.

NON-PROFIT EMPOLYMENT/VOLUNTEERING

CUPE 2278 *September 2022 – August 2023*

Contracted Community Organizer

- Executive member of the Engineering Organizing Unit Committee and an active contributor to the Data and Mapping Unit Committee, 2 units in Canada's single largest (successful) union drive in modern history.
- Our filing for automatic recognition garnered the majority support of a student body comprising over 8,000 individuals. My focus was specifically on organizing the second largest body of UBC's graduate students (engineers and applied scientists) ~1200 students.

United Way T&T *March 2020 – August 2020*

Part-Time Organizational Volunteer

- Logistically supported a fundraising campaign focused on increasing the number and quality of suitable remote learning spaces in orphanages around the island as classes were moved online in response to the pandemic.
- Worked on a team focused on increasing the number of licensed children's homes in operation locally by connecting lapsed homes to resources that would help reestablish their compliance and, thus, increase their standard and capacity of care.

T&T Red Cross Society (TTRCS) *March 2020 – August 2020*

Part-Time Organizational Volunteer

- Worked with TTRCS to initiate their local Geographic Information Systems (GIS) capacity building efforts with the goal of collecting and integrating more qualitative and quantitative data into the regional organization's decision making and project-planning procedures.
- Our initial focusing was on mapping high-risk hazard areas (flooding exposed) and vulnerable populations (Venezuelan migrants).

COMMERCIAL SOFTWARE SKILLS

- Solidworks
- ShipConstructor
- ANSYS Fluent & LS-DYNA
- Simerics-MP+
- Creo Simulate
- MathCAD / NavCAD
- HECSALV
- MOSES & Maxsurf
- MAESTRO
- GHS
- Simcenter
- LabVIEW
- Autodesk Design Suite: Inventor, AutoCAD, Navisworks, Revit etc.
- Rhinoceros: Orca3D, OrcaFlex, Grasshopper, Flamingo
- Microsoft Office Suite: Word, Excel, Project, Visio, PowerPoint, Teams, One Note.

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PROFESSIONAL SOCIETY MEMBERSHIP

- The Society of Naval Architects and Marine Engineers (SNAME) — *Spring 2013 - Present*
- Tau Beta Pi Engineering Honors Society (TBP) — *Fall 2014 - Present*
- Canadian Association for Computational Science and Engineering (CACSE) — *Fall 2020 - Present*
- The American Society of Mechanical Engineers (ASME) — *Fall 2020 - Present*
- American Physics Society (APS) — *Summer 2020 - Present*
- U.S. Association for Computational Mechanics (USACM) — *Summer 2020 - Present*
- The Pacific Institute for the Mathematical Sciences (PIMS) — *Summer 2020 - Present*
- American Institute of Aeronautics and Astronautics (AIAA) — *Fall 2014 – Spring 2016*
- American Society of Naval Engineers (ASNE) — *Spring 2013 – Spring 2016*

TECHNICAL EXPERIENCE

Technical & Research (T&R) Program Involvement (SNAME)

Contributing Member

- M – 16 Panel: Propulsion Shafting — *Spring 2018 - Present*
- SC – 2 Panel: Sailing Craft — *Fall 2018 – Spring 2020*
- HS – 4 Panel: Design Procedure and Philosophy — *Spring 2019 - Present*
- SD – 5 Panel: Advanced Marine Vehicles — *Fall 2019 – Fall 2023*

SailBOT @ Virginia Tech — *August 2013 - June 2016*

Project Manager (Commodore)

- Directed the development of a 2-meter class fully autonomous sailboat to compete in the annual International Robotic Sailing Regatta.
- Managed an interdisciplinary team of 40 undergraduate students of various academic levels, and a budget in excess of $30,000.
- Grew the team's size and budget, developed its online presence, negotiated for academic credit and research opportunities, increased sponsorship and community outreach participation, implemented documentation procedures, and redesigned the leadership structure.

Future Guided Missile Trimaran Corvette Design Team — *Fall 2015 - Summer 2016*

Team Member

- Conducted a detailed concept exploration and development of a Future Guided Missile Trimaran Corvette (FGT) for the US Navy.
- The design spiral encompassed the full spectrum of jobs from hull form design to operational cost, risk, and effectiveness analyses.
- Representing Virginia Tech, the team's paper won an honorable mention in the Dr. James A. Lisnyk student ship design competition.

Team Bacchanal, T&T Powerboat Association — *April 2020 – August 2020*

Marine Engineer Trainee

- Generated engineering drawings and hull models; inventoried, tracked, and ordered system resources/components; maintained equipment; troubleshot systems; and helped rig and repair the vessel in preparation for and throughout the 95mph-class racing season.

LEADERSHIP EXPERIENCE

President	MECH Graduate Student Association	*Spring 2022 - Spring 2023*
Vice-Chair	UBC CACSE Chapter	*Fall 2021 - Spring 2022*
Graduate Student Body Representative	MECH Sustainability Committee	*Fall 2021 – Spring 2022*
Electronic Media Chair	SNAME HQ Student Steering Committee	*Spring 2021 – Fall 2021*
Treasurer	SNAME UBC Student Section	*Fall 2021 - Present*
SMC Short Course Planning Committee	SNAME Young Professionals Section	*Spring 2019 – Fall 2019*
Communications Chair	SNAME Great Lakes Section	*Fall 2017 - Fall 2019*
Commodore	VT SailBOT	*Fall 2015 - Spring 2016*
Hull Construction Captain	VT SailBOT	*Fall 2014 - Spring 2015*
Vice-President and Service Chair	VT Caribbean Student Organization	*Spring 2014 - Spring 2016*
Student Engineering Council Representative	SNAME VT Student Section	*Spring 2015 - Spring 2016*
Treasurer	Tau Beta Pi Engineering Honors Society	*Fall 2015 - Spring 2016*
Senior Global Ambassador	VT Cranwell International Center (CIC)	*Fall 2014 - Spring 2016*
Student Ambassador	Aerospace and Ocean Engineering Department	*Spring 2015 - Spring 2016*
Undergraduate Student Body Representative	CIC Program Review Committee	*Fall 2014 - Spring 2015*
Prefect Administrative Council	Our Lady of Fatima College (OLFC)	*Fall 2010 - Spring 2011*
St. Mark House Captain	Our Lady of Fatima College (OLFC)	*Fall 2010 - Spring 2011*
OLFC Student Body Representative	T&T National Youth Parliament	*Fall 2010*