



**NSERC Canadian Network
for Research and Innovation in
Machining Technology (CANRIMT2)
NSERC Project Number: NETGP 479639 - 15**



**Project Interim Progress Report
(Rapport d'avancement de project intérimaire)
Apr 1, 2019 – Oct 31, 2019**

**Please submit by Oct 25, 2019
(Attn: management@nserc-canrmt.org)**

Instructions

*This progress report, updated milestones and the Form 300 are required as a condition of research funding support from the sponsors of the NSERC CANRIMT. **Please report for activity in the current reporting period only.***

SUMMARY

THEME : Adaptive tooling/processes and novel manufacturing processes/applications	Leader/ Chef: Veldhuis, McMaster
PROJECT IV.D.5: EDM Texture for Control of Fluid Drag and Surface Traction	Leader/ Chef: Koshy, McMaster
PROJECT DURATION/DURÉE DU PROJET : July 2019 to July 2021	
STATUS/STATUT: <i>(Milestones to be updated by each Project Leader)</i>	
<input type="checkbox"/> Ahead of Schedule	<input type="checkbox"/> On Schedule
<input checked="" type="checkbox"/> X Delayed	<input type="checkbox"/> Cancelled

PROJECT DESCRIPTION/ DESCRIPTION DU PROJET

(Brief description in point form, including role of project in Theme.)

- The proposed research centres on a unique characteristic of EDM-ed surfaces that they comprise relatively few peaks interspersed amongst large valleys. The height distribution is therefore skewed to the right as opposed to being Gaussian. Such a surface texture is ideally suited to engineering the topography of a surface towards realizing control of fluid drag and surface traction.

PROJECT OBJECTIVES & METHODOLOGY/ OBJECTIFS DU PROJET & MÉTHODOLOGIE

(Include alignment with Network objectives.)

This work will investigate the role of an EDM texture in influencing drag as the textured surface moves past a fluid medium. Given the positive skewness of EDM surfaces that provide mechanical interlocking at the micro-scale, the research will also characterize and investigate the enhanced surface traction that can be expected to materialize between two EDM textured surfaces in contact.

1. RESEARCH TEAM/ ÉQUIPE DE RECHERCHE

(Summary for the current reporting period)

CONFIDENTIAL AS PER NSERC CANRIMT2 AGREEMENT

NSERC Canadian Network for Research & Innovation in Machining Technology
The University of British Columbia, Vancouver, BC V6T 1Z4

NSERC CANRIMT - NETGP 479639 - 15 (2016-2021)
Interim Progress Report – Nov 1, 2017 – Mar 31, 2018

PROJECT # & TITLE: IV.D.5. Texture to control fluid drag and surface traction

**1a: Research Personnel (Supervisors, Co-Supervisors, Collaborators)/
Personnel de recherche**

Name, given name/ Nom., prénom	Organization/ Organisation	Sup./Co-Sup./ Collaborator	E-mail/Courriel	Phone No./ Téléphone
Koshy, Philip	McMaster		koshy@mcmaster.ca	905 525 9140 x27833

**1b: Students, Postdoctoral Fellows, Research Assist./
Assoc./Eng., Technical/Professional, Guests (from outside Québec; from outside Canada)/
Étudiants, Boursier de recherches postdoctorales, assistants, techniciens et invites
 (invite hors Québec; hors Canada)**

Name, given name/ Nom., prénom	Position	Organization/ Organisation	Name/Nom. (S) or /ou (C)*	Start/ Début	End/ Fin	CANRIMT Salary/Mo incl ben.	Extern. funding amount	Extern funding source
Felipe Coelho	MASc student	McMaster University	Koshy (S)	Sep 2019	Sep 2021	\$1,300		

*(S) – Supervisor

(C) – Co-Supervisor

TOTAL #	BASc	MASc/ M.Eng.	Ph.D.	PDF	Res. Asst.	Res. Assoc.	Res. Eng.	Tech./ Prof.	Guests/ outside Québec	Guests/ outside Canada
1		1								

**1c: Partners & Contributions/
Partenaires et Contributions**

Organization / Organisation	Acronym/ Acronyme	Contact	Cash/ Espèce	In-Kind/ Nature	Overhead/ Frais généraux	Total
Pratt & Whitney Canada	PWC	Mr. McIntosh				

**2. RESEARCH PLAN FOR THE CURRENT PERIOD/PLAN DE RECHERCHE POUR
 LA PÉRIODE ACTUELLE** (Please list both the technical objectives, methodologies and milestones as stated in the
 previous report.)

The project was initiated in Sep 2019. The student working on the project is currently completing course work requirements. In this reporting period, he will design and fabricate a setup for the measurement of friction and damping originating from EDM surface.

**3. ALIGNMENT OF RESEARCH PROJECT WITH NETWORK OBJECTIVES/
 ALIGNEMENT DU PROJET DE RECHERCHE AVEC LES OBJECTIFS DU RÉSEAU**
 (Please comment on the alignment of the research project with the overall Network objectives.)

The work is in alignment with the theme of innovations in machining.

4. PROBLEMS and RESOLUTIONS/ PROBLEMES ET SOLUTIONS PROPOSÉES

(Please summarize any problems arising during the current reporting period and their resolution or plans for resolution.)

Problem/ Problème:

Resolution / Résolution:

5. RESEARCH PROGRESS and RESULTS/ PROGRÈS DE LA RECHERCHE et RESULTATS:

(Summarize progress and results below.)

5a: MILESTONES/ÉTAPES

Summarize progress on milestones – including % completed – as outlined in the Research Plan for the current reporting period and any modifications since the last reporting period. (Milestones document also to be updated for each project.)

MILESTONE/ ÉTAPE:

Progress:

Modifications:

% Completed/ Rempli

0%

NSERC CANRIMT - NETGP 479639 - 15 (2016-2021)
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PROJECT # & TITLE: IV.D.5. Texture to control fluid drag and surface traction

5b: PUBLICATIONS and PRESENTATIONS/ PUBLICATIONS ET PRESENTATIONS

Please list all publications directly arising from Network-funded research during the current period. Do not include abstracts.

A: REFEREED CONTRIBUTIONS - ARTICLES			
<i>Include articles in refereed publications – please specify whether the article has been submitted (S), accepted (A) or published (P).</i>			
Last Name, Initial	Year	Title, Journal, Volume	Status
B: REFEREED CONTRIBUTIONS - OTHER			
<i>Include papers in refereed conference proceedings, letters, notes, communications, review articles, monographs, books, book chapters and government publications.</i>			
Last Name, Initial	Year	Description	Status
		Conference Title, Location and Date (Status: Invited, Not invited)	
		Journal/Book/Publication Title (Status: S-submitted; A-accepted; P-published)	
C: NON-REFEREED CONTRIBUTIONS			
<i>Include papers in non-refereed conference proceedings, papers, letters and review articles.</i>			
Last Name, Initial	Year	Description	Status
		Conference Title, Location and Date	
		Journal/Book/Publication Title	
D: SPECIALIZED PUBLICATIONS - PRESENTATIONS			
<i>Include theses, presentations, industrial/technical reports, internal reports, discussions of abstracts and symposium records.</i>			
Last Name, Initial	Year	Description	Status
		Thesis or Conference Title, Location and Date	
		Journal/Book/Publication Title	
E: PUBLICATIONS – Not originally funded by NSERC CANRIMT but continuing or completed with Network funding			
Last Name, Initial	Year	Description/Title (include start date of NSERC CANRIMT funding)	Status
F: PUBLICATIONS – Not funded by NSERC CANRIMT but related to the Network research focus			
Last Name, Initial	Year	Description/Title	Status

PROJECT # & TITLE: IV.D.5. Texture to control fluid drag and surface traction

5c: PATENTS and LICENSES/ BREVETS ET LICENSES

Non-disclosure agreements signed, patent applications filed, patents issued, copyrights, licenses under negotiation, licenses granted, etc.

Category	Owner	Description

5d: OTHER COMMUNICATIONS, AWARDS/ AUTRES COMMUNICATIONS, PRIX

Provide information on additional communications related to your work, such as awards and distinctions, news stories, interviews, public forums, press releases, etc. for the current reporting period (please provide copies or links.)

Name, given name/ Nom, prénom	Details	Date	Link or copy attached

6. TRAINING/ FORMATION

(Describe the extent of cross-network and partner involvement in training for the current reporting period.)

The student is currently completing course work requirements, and is also being trained on the operation of the sink EDM machine tool.

7. RESEARCH PLAN FOR NEXT 6 MONTHS/ PLAN DE RECHERCHE POUR LES 6 PROCHAINS MOIS

(Describe Planned Research Activities for the next 6 month period and include any modifications made during the current reporting period.); also please list both the technical objectives and milestones.)

Design and fabricate an experimental setup for the measurement of friction and damping originating from EDM surfaces

PROJECT # & TITLE: IV.D.5. Texture to control fluid drag and surface traction

8. **OPTIONAL – Comments, Questions and/or Feedback/**
OPTION – Commentaires, questions et/ou des commentaires

Include any supplemental comments or questions pertaining to the Network here.

9. **NETWORK EVENTS ATTENDED or SUGGESTIONS /**
ÉVÉNEMENTS RÉSEAU ONT ASSISTÉ ou SUGGESTIONS

Please list any Network-related events attended and include comments and suggestions for events which may be helpful and informative for Network members to attend in future.

<i>Event</i>	<i>Comments/Suggestions</i>
VMPT Conference, Montreal, May 2017	