# ATTENDEES PLEASE:

**THIS MEETING IS BEING RECORDED**

**CAMERAS OFF**
**MICROPHONES MUTE**
UNLESS ASKING QUESTION

# ECE790 Three Minute Thesis (3MT®) Workshop

# Engaging Real People in Three Realistic Minutes

John Bandler, Nicholas Simard, and Tim Davidson

Presented via Zoom at
McMaster University, February 27, 2023

# Our Instructional Assistant

**Nicholas “Nick” Simard** is an industrial PhD candidate in Electrical and Computer Engineering where he researches ‘Big Data’ neuroimaging analytics to assess concussions. Nick has presented at conferences across North America and Europe and has further participated in a variety of 3MT competitions including the Big Ideas Competition, McMaster 3MT, and GradFlix.

## Nicholas Simard

PhD Candidate, Elect. & Computer Engineering

# Our 3MT® Contributor

Australian by nature, with some post-graduate nurturing in England, **Tim Davidson** is a Professor at McMaster University, where he develops design insights and algorithms for signal processing, communications, and control systems, and helps others do the same.  He has served as a department chair and as coach of the university's field hockey team, each for a decade.

**Tim Davidson**
Professor, McMaster University

# Our 3MT® Guest

**Erin Kiley** is an Associate Professor of mathematics at the Massachusetts College of Liberal Arts, working on multiphysics computer models of high-power microwave applications that include heating and sintering. She received her PhD in Mathematics from Worcester Polytechnic Institute in 2016. She co-organized all six 3MT® Competitions for the IEEE International Microwave Symposium from 2017 to 2022, and serves on the committee for 2023.

**Erin Kiley**
Associate Professor, MCLA

# Our 3MT® Guest

**Connor Rowe** is a Masters student at the Institut National de la Recherche Scientifique in Montreal, Quebec, Canada. He is part of the Ultrafast Optical Processing group led by Professor José Azaña, and studies time-frequency analysis of signals and images using a photonics approach.

**Connor Rowe**
Masters Candidate, INRS Montreal

# Our 3MT® Guest

**Megan Vierhout** is a PhD candidate at McMaster in the Medical Sciences program. Her research focuses on exploring the mechanisms for a rare fatal lung disease. Megan has a passion for public speaking and communication. She has participated as a finalist in McMaster's 3 Minute Thesis and GradFlix competitions, and has won multiple conference presentation awards.

**Megan Vierhout**
PhD Candidate, McMaster University

# Zoom Meeting Attendee Display Suggestions

avoid virtual backgrounds

“Hide non-video participants”

in gallery view, side-by-side mode, scale speaker & slide windows by moving the partition between them left-right

Bandler, 2020

# Acknowledgements

Robin Aiello, Gregory Atkinson, Mohamed Bakr, Beth Bandler, Ian Bruce, Erica Dao, Tim Davidson, Aline Eid, Ricardo Figueiredo, Adam Fortais, Cheryl Gies, Teng Guo, Shawn Hercules, Sherry Hess, Jimmy Hester, Rachelle Ho, Erin Kiley, Ana Kovacevic, Michelle Ogrodnik, Sawayra Owais, Valentina Palazzi, Aaron Pitcher, Connor Rowe, Daniel Shields, Madeline Simpson, Daniel Tajik, Megan Vierhout, John Vlachopoulos, Mahmoud Wagih, Emily Wood, Melih Yayli, Sara Zendehboodi, Canxiu Zhang + many more


Bandler, 2023t

courtesy: Robin Aiello

# Agenda

welcome guests

Mahmoud Wagih’s 2020 “virtual” 3MT® video

Connor Rowe’s 2022 winning 3MT® video

presentation do’s, presentation don’ts

do’s & don’ts: “virtual” vs. “digital” vs. “in person”

3MT® case studies

core images, slide composition, title formulation

authenticity vs. theatricality

concluding remarks

Two extraterrestrials experience feelings for the first time

# THE CAFFEINE RABBIT HOLE

Jaclyn Scobie as LENIK  Steph Christiaens as DARA

Music by Emily Wood

A Short Film Written, Produced & Directed by John Bandler

Assistant to the Director: Megan Vierhout

Editor & Technical Consultant: Jeremy Major

Co-Producer: Beth Bandler

Coffee Shop Logo and Promo Image Design & Processing:
Rachelle Ho & John Bandler

www.bandler.com/rabbit

# Overview

story, persuasion, bias, trust, impact, fear, first impressions, citation, subtext, metaphor, theatricality, authenticity, articulation, etiquette, awareness, being remembered, slide composition, theme, respecting your audience, the elevator pitch, ethics, admitting setbacks . . .

Bandler, 2020

# Are You Presenting . . .

in a physical classroom or auditorium?

to an online meeting?

one-on-one, in person?

one-on-one, online?

to a (recording) camera?

to an **off-camera** interviewer?

to an **on-camera** interviewer?

voiceover?

Bandler, 2021

# The 3MT® Requirements

3-minute (**or less**) oral presentation

one static PowerPoint slide
(**for the full duration**)


Bandler and Kovacevic, 2017

# Three Minute Thesis
# Judging Criteria

Comprehension & Content

Engagement & Communication

# Three Minute Thesis (3MT®) Rules In A Nutshell

a single static PowerPoint slide is permitted; no additional electronic media; no notes; no additional props

competitors exceeding 3 minutes are disqualified

presentations are to be spoken word

presentations are considered to begin when a presenter starts presenting through movement or speech

the adjudicating panel's decision is final

https://threeminutethesis.uq.edu.au/resources/competition-rules

# Do’s and Don’ts

no jargon
avoid acronyms
don’t get stuck in the weeds
use metaphors
include human stories
**memorize** (authenticity at risk)
**give audience tangible takeaways**

Bandler, 2016-2018, 2020

# In Our Case Studies Look For. . .

metaphor
believability
purposeful gestures
engaging with the slide or images
dramatic pauses
making it relatable
humor
storytelling
**audience takeaways**

Bandler, 2021

# CASE STUDY: VIRTUAL 3MT®
# MAHMOUD WAGIH

# Mahmoud Wagih, Second Place Winner

“Smart Textiles for Recycling Radio Waste”

IEEE Microwave Week 2020 3MT®


Collecting Radio "Rain"
Mahmoud Wagih
Southampton

# Mahmoud Opens With…

(*both hands raised in contemplation*) Imagine (*pause, emphatic)* if all the rain (*pause*) was wasted. (*pause, a quizzing look straight into the camera*) That doesn't sound right? (*emphatic, with gestures of relief*) Thankfully, this doesn't really happen to rain.

—Mahmoud Wagih, 2020

Bandler, 2020

# Mahmoud Closes With…

(*gestures to self, emphatic*) My goal is to get you to forget about your batteries. (e*mphatic gestures*) But please (*pause, looks deliberately upward as if at overhead clouds, imploring)* don't forget your umbrellas. (*smiles*) Thank you.

—Mahmoud Wagih, 2020

# CASE STUDY: 3MT®
# CONNOR ROWE

# Connor Rowe, First Place Winner

“Ultrafast Light-based Spectrogram”

IEEE Microwave Week 2022 3MT®


NOCTURNE DE CHOPIN

# Connor Opens With…

(*with confidence*) Hi. I'm Connor Rowe. I'm a master's student in Quebec at the INRS in Montreal, Canada. (*with business tone*) Let's talk about signal processing. (*gestures at and engages audience*) Who here is a musician? (*waits*) A few people. (*gestures, animated, at slide depicting a Chopin nocturne*) Can anyone play this piece?

—Connor Rowe, 2022

Bandler, 2023

# Connor Closes With…

(*emphatic, looks directly at audience*) This light-based spectrogram we've developed allows you to tune into the concerts of ultra-fast events, (*touches ear*) hear the notes played by distant stars and galaxies, and ultimately allows you to play your own signals faster than ever before. Thank you.

—Connor Rowe, 2022

# Connor Rowe – “Ultrafast Light-based Spectrogram”

377 words

Hi. I’m Connor Rowe. I’m a master’s student in Quebec at the INRS in Montreal, Canada. Let’s talk about signal processing. Who here is a musician? A few people. Can anyone play this piece? Sheet music like this tells you the musician which notes or frequencies to play, and when to play them. Frequency over time. Imagine instead I draw you a picture of a wave, and your job is going to be, tell me how it’s going to sound. That’s not an easy job, especially when multiple notes are being played at the same time. So what’s my point? Well, in comparison to looking at a signal just in time, or just in frequency, showing both simultaneously is the most intuitive way to visualize a signal. The fancy name for this is a spectrogram. With a spectrogram we can see how frequencies change over time. So what we want is sheet music for ultra fast signals.

# Connor Rowe – “Ultrafast Light-based Spectrogram”

377 words

Now imagine again you’re at a concert for your favorite band. You’d probably notice [if in] if they decide to skip every note. Similarly, if they decide instead of playing to hand you a CD, and say you can listen to it later, you’d probably want your money back. Well, just like that we want to catch every single note and we want to process in real time, not record and listen later. So how fast is ultra fast? We’re talking about frequencies millions of times higher than your ears are capable of hearing, notes changing billions of times per second. That’s ultra fast and these signals they’re useful for secure communications, astrophysics, radar, and much, much more.

Bandler, 2023

# **Connor Rowe – “Ultrafast Light-based Spectrogram”**
377 words

So what’s the problem? The problem is the best electronics in the world are not capable of dealing with these signals. They miss notes or they don’t process in real time. Electronics are simply too slow. Enter photonics. Just like electronic processing uses electricity, photonic processing uses photons, particles of light. We can do signal processing using just light, and it’s outstandingly faster. This light-based spectrogram we’ve developed allows you to tune into the concerts of ultra-fast events, hear the notes played by distant stars and galaxies, and ultimately allows you to play your own signals faster than ever before. Thank you.

Bandler, 2023

## Language/Articulation/Pronunciation . . .

choose opening words carefully

choose words carefully

choose metaphors carefully

speak (more) slowly

be redundant

repeat troublesome/unexpected/important words

get your grammar checked!

practice with non-native English speakers!

Bandler, 2022

# Don’t . . .

be ill-prepared, rush

run out of time

speak in a monotone

seem distant

swallow words

sabotage your name

sabotage your first impression

Bandler, 2020

# Cut The Jargon!

**extreme jargon**

Fourier transform
quantum
induction
permittivity
permeability
Kriging
reduced order
Krylov subspace
polynomial chaos

**avoid, reject …**

**misunderstood**

spectrum
functional
deterministic
resonator
dimensional
statistical
femtosecond
rectification
efficiency

**ensure takeaway**

**general usage**

laser
frequency
cognitive
radiation
gain
Bluetooth
metadata
polarized
surrogate

**a sales job?**

Bandler, 2020, 2021

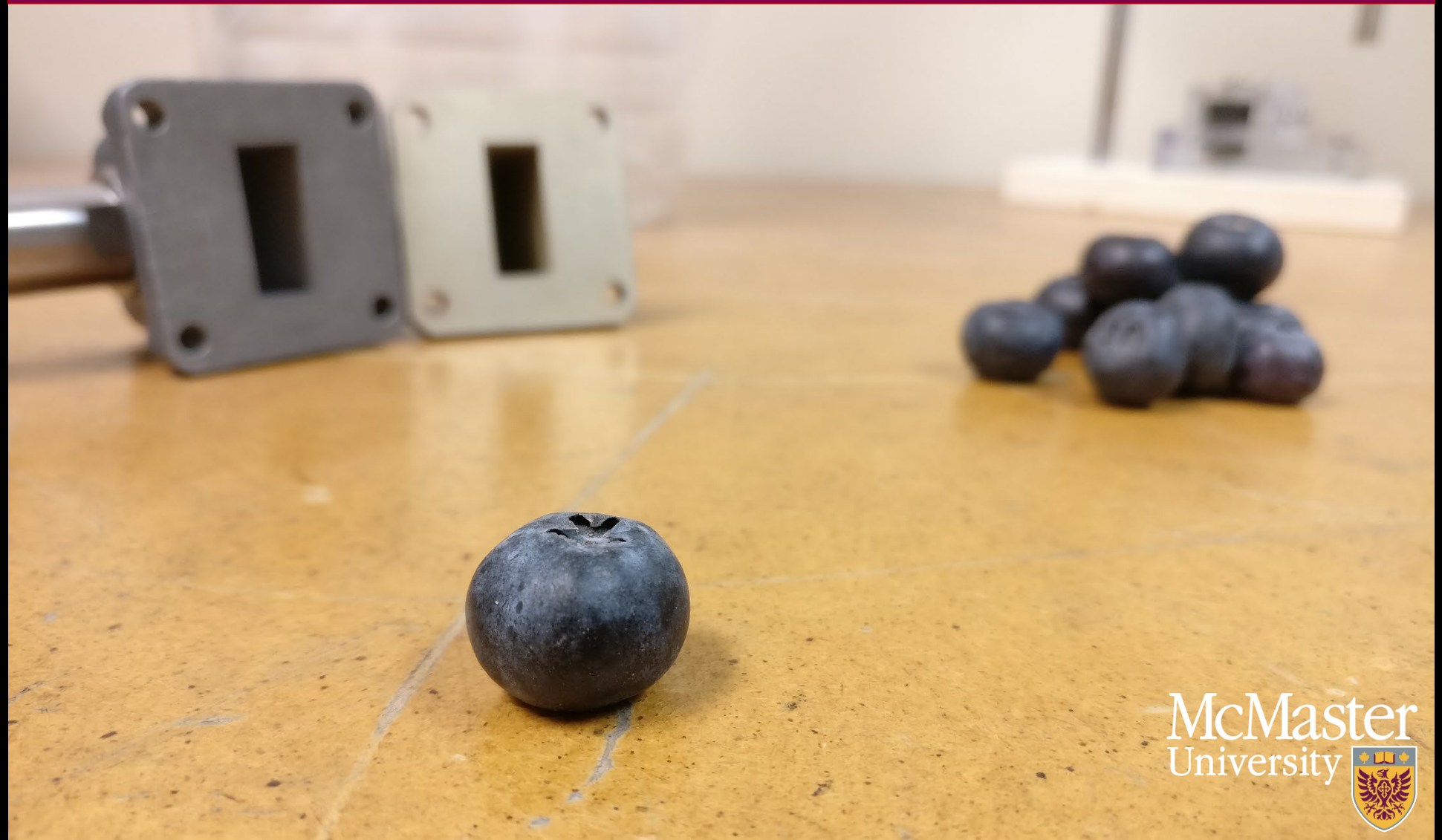
# SINGLE STATIC SLIDES: KEEP THEM SIMPLE!

# DEVELOP YOUR **SLIDE(S)** FIRST!

Bandler, 2020

# Microwave Holography:
# The Future of Medical Imaging

Daniel Tajik



# Sniffing out Weapons with Microwaves

Aaron Pitcher


[Photo Credit: D. Tajik, A. Pitcher]

# Brainwave Analysis for Stroke Detection
## Canxiu Zhang

# Collecting Radio “Rain”

Mahmoud Wagih

UNIVERSITY OF Southampton

# CORE IMAGES:
# MAKE THEM MEMORABLE!
# MYSTERY HELPS

# 3MT® Core Images: Memorable, Meaningful, Mysterious

**A blueberry** —Daniel Tajik (2017)
**A person pulling a suitcase** —Aaron Pitcher (2018)
**A line on crumpled paper** —Canxiu Zhang **(**2018)
**A tarantula** —Aline Eid (2019)
**Water glasses under umbrella** —Mahmoud Wagih (2020)
**A wildfire** —Jay Sheth (2020)
**A guitar** —Nikita Mahjabeen (2020)
**Sheet music by Chopin** —Connor Rowe (2022)

Bandler, 2021, 2023

# TITLES:
# CATCHY BUT MEANINGFUL!

# 3MT® Titles: Catchy, Meaningful ...

**Sniffing Out Weapons With Microwaves**
Aaron Pitcher (2018)
**Origami: Unfolding the Future of Engineering**
Syed Abdullah Nauroze (2018)
**Are We Drinking Pharmaceuticals?**
Arif Alam (2018)
**Where Does Cancer Begin?**
Erica Dao (2019)
**Fighting Obesity With Fat**
Julian Yabut (2019)

Bandler, 2020

# OPENING LINES

Bandler, 2020

# 3MT® Opening Lines

*Occurring with little apparent warning, strokes are a leading cause of disability.*

“Have you? Your relatives. Your friends. Ever suffered from a stroke?”—Canxiu Zhang, 2018

*The more a person undergoes X-ray scans the greater the risk they will develop cancer.*

“X-rays. Cause. Cancer. It’s a little unnerving to think about, isn’t it?”—Daniel Tajik, 2017

Bandler, 2020

# CLOSING LINES:
# BRING YOUR STORY
# FULL CIRCLE

# Mahmoud Wagih's 2020 3MT® Opening & Closing Lines

**Opening:**
"Imagine if all the rain was wasted. That doesn't sound right? Thankfully, this doesn't really happen to rain."

**Closing:**
"My goal is to get you to forget about your batteries. But please don't forget your umbrellas. Thank you."

Bandler, 2021

# DETAILS, DETAILS, DETAILS: IT'S ALL ABOUT THE DETAILS

# Online Technical Issues and Limitations

medium fraught with
- technical limitations
- physical limitations
- wrong assumptions, surprises

internet bandwidth
camera resolution
microphone quality
presence/absence of a “virtual” background
etc.

Bandler and Kiley, 2020

## Pacing, Staging, Engaging 1

- 120 words per minute absolute max (110 for virtual). Few exceptions.
- Start early on core image(s) and integrate it with your speech.
- Indicate your qualifications.
- Consider story format: once upon a time . . . and finally?
- Avoid generalities. Be specific.
- Stand, move around, while memorizing script.
- Rehearse afresh with people who haven’t heard you or about your work.
- Don’t be satisfied with kindness.

Bandler, 2017, 2021

## Pacing, Staging, Engaging 2

- Don’t look like you’re reading a script. Make “eye contact.”
- Articulate every single word clearly, including your name.
- *Pause*. The “floor” is yours. You will not be interrupted.
- “Listen” to your “audience”! “Listen” to yourself!
- Learn to be “in the moment:” you’ll recover if things go wrong.
- Dress is important. Authenticity vs. informality.
- Be kind to judges/viewers: they’ll thank you!

Bandler, 2017, 2021

# Virtual Presentations 1

- Script redundancies help combat internet/technical issues.
- Connect to your slide(s) with relevant words & gestures.
- Use Bluetooth mic for freedom of movement.
- Don’t rush.
- Don’t look at the screen; don’t read your script from the screen.
- Camera at eye level, even when standing.
- Look into the camera.
- Look away only to signal thinking in real time.
- Acknowledge a distraction in real time.

Bandler, 2020

## Virtual Presentations 2

- Sit (stand) away from the camera to reveal hand gestures.
- Let hands be visible. Be upright, look excited.
- Remember: your backdrop is a prop!
- Compose your space.
- Face and eye movements are important.
- *Note: left (right) side of slide is reversed to your audience!*
- Rehearse. Record. Watch. Rehearse. Record. Watch.

Bandler, 2020

# FIRST IMPRESSIONS

# Your Live Audience, Your Live Judges

hear your host's "introduction"
see you "stumble" onto the stage
are biased before your first word
may ignore/dislike your slide
absorb audience reactions
consider relative performance

Bandler, 2020

# Be Authentic

be yourself

be sincere

be personal

don’t “act”

don’t “pretend”

kill your fake “speech mode”

Bandler, 2020

# Be Engaging

be empathetic

be approachable

be conversational

be “in the moment”

be memorable

Bandler, 2020

# Be Clear

skip jargon

skip mind-twisting logic

keep sentences short, punchy

speak words clean, crisp, clear

Bandler, 2020

# Last-Minute Tips

make sure your name is repeatable

make “eye contact” with the audience

be “in the moment” as if in conversation

gesture with open hands

articulate clearly

**don’t:** fidget, hold hands, swallow words

PRESENTATION DAY

**APRIL 12, 2023, 10:00 am**

WHAT TO EXPECT


# ECE790/
# Three Minute Thesis
# (3MT®)

McMaster University

**(TEMPLATE, to be provided)**

3MT® THREE MINUTE THESIS
FOUNDED BY THE UNIVERSITY OF QUEENSLAND

Title of Presentation (same font)

**Speaker's Name**
Speaker's Affiliation

**(to be prepared by speaker)**

McMaster University

SPEAKER'S SLIDE

**(4:3 to be prepared by speaker)**


# ECE790/
# Three Minute Thesis
# (3MT®)

McMaster University

# Virtual 3MT: Zoom Meetings

approx. 2 to 3 per week, invitations sent to all

you can share: slides, scripts

critiques will help everyone

you can rehearse, get feedback

occasional one-on-one consultations

Bandler, 2020, 2021, 2022

# **In-Person 3MT Meetings**

approx. 2

end of March/start of April

room ITB A113

rehearsals for **memorized** talks

rehearse, get feedback

# Virtual 3MT: Tips

keep slides simple

- one main image, mystery helps
- no jargon, no abbreviations

avoid words except for

- your name (large font)
- title of presentation (large font)
- citations (all sources, small font)

Bandler, 2020

# ZOOM MEETINGS: NEXT DAYS

**Thursday, March 2, 10:00 am**
**Tuesday, March 7, 10:00 am**
**Thursday, March 9, 10:00 am**

DRAFT 4:3 SLIDES & SCRIPTS:
**Tuesday, March 7**

Draft scripts: 300 words

4:3 slides

Technical abstract: 150 words

Deadline for drafts: March 7

Final deadline, scripts & slides: April 6

Bandler and Simard, 2023

# ECE790 3MT Dropbox Upload Link

https://www.dropbox.com/request/bGL6FBpzyOkLuwKtgy38

for draft slides (pptx, < 1MB, 4:3) and scripts

doc, ppt or other relevant file need your name & 3MT right in the filename, e.g., John_Bandler_3MT and be self-consistent throughout

**JOHN BANDLER, NICHOLAS SIMARD, and TIM DAVIDSON**

ARE AVAILABLE FOR GROUP MEETINGS & CONSULTATION

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# For Further Study, Google:

MTT IMS YouTube 3MT playlists (2017-2022)

McMaster ECE Department 3MT playlists

John Bandler's YouTube channel

IEEE Microwave Magazine 3MT articles (2017-2022)

Bandler, 2022

# THANK YOU


McMaster University