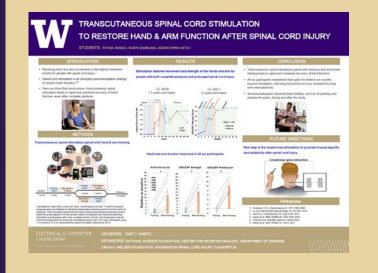


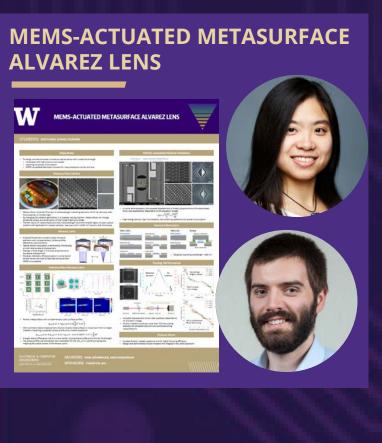
UNIVERSITY of WASHINGTON

# RESEARCH SHOWCASE 2021

#### **TRANSCUTANEOUS SPINAL CORD STIMULATION TO RESTORE HAND AND ARM FUNCTION AFTER SPINAL CORD**

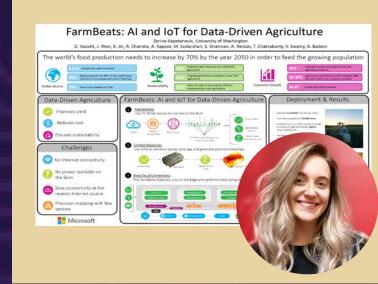


A MACHINE LEARNING APPROACH FOR ACCURATE AND REAL-TIME **DNA SEQUENCE IDENTIFICATION** 





#### **FARMBEATS: AI AND IOT FOR DATA-DRIVEN AGRICULTURE**





#### SYSTEM IDENTIFICATION VIA **NUCLEAR NORM REGULARIZATION**

	System identification: algorithms	ner Engineering, University of California, Riverside
Abstract	System stantication algorithms	Main theorem - Unregularized
$\alpha$ of all or a similar of har-next here means detailation in the second secon	$\begin{split} & the set of point of a point of a set of the set$	Let the anomalous of Hamile Let $x$ , such a source of much the transformation $(\mu_{1},\mu_{2},\mu_{3},\mu_$
Problem formulation		[Hashel Spectral Direct $\sigma\sqrt{n/T}$ ] $\sigma\sqrt{n/T}$ ] $\sigma\sqrt{n/T}$ ] $(1 + \sigma)\sqrt{n/T}$ Experiments
$\phi_{-1}, \rho_{-1}$ be the system apply, side, surget, mass. These states $\mu(t) = 1$ , $\mu(t) = h(t)$ , $h(t) = h(t)$ , $\pi(t) = \pi(t) + h(t)$ , $\pi(t) = \pi(t) + t(t)$ , $h(t) = \pi(t) = \pi(t) + \pi(t)$ , $\pi(t) = \pi(t) + \pi(t))$ , $\pi(t) = \pi(t) + \pi(t))$ , $\pi(t) = \pi(t) + \pi(t))$ , $\pi(t) = \pi(t) + \pi(t))$ , $\pi(t) = \pi(t) + \pi$	$\begin{split} & Main theorem = Regularized \\ & Let be denoted at Hald to v,v,\eta symmetry is R and under if any large to T & \  H(k) - W(k) \  \leq \left\{ \sqrt{\frac{2\pi}{M^2 T}}  i  n \leq \min\{0^k,v\} \\ & \sqrt{\frac{2\pi}{M^2 T}}  i  n \leq \tau \leq \min\{0^k,v\} \right. \end{split}$	Experiments Environments replanting adjustments • Chara angular value gale • Endert worry with here jubernatures • Endert worry with here jubernatures • Endert worry with here jubernatures
E S	Shaped input	The second secon
a mpch-strept mapping sum also be arrange as $\mu \to a + b = L$ space response $h_{\mu} = a + b = L$ $\mu = -a = h_{\mu} = \frac{h_{\mu}}{h_{\mu}} + \frac{h_{\mu}}{h_{\mu}} - \frac{h_{\mu}}{h_{\mu}} + $	$u_{ij} = \frac{1}{2} \int_{\frac{1}{2}} \int_{\frac{1}{2}}$	$\begin{tabular}{ c c c c } \hline & & \hline \\ \hline & & & \hline \\ \hline & & & & \hline \\ \hline & & & &$

#### **FAIR ORDERING IN DECENTRALIZED FINANCE**

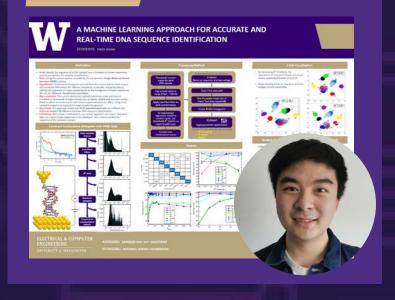


#### SAFETY-CRITICAL CONTROL **OF POWER SYSTEMS**

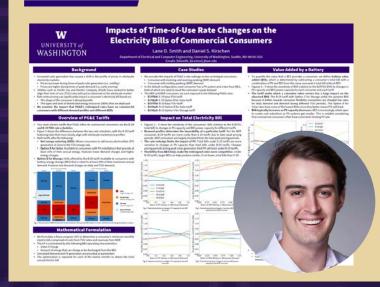
WASHINGTON	Daniel Tabas and Boosen Zhang Renewable Energy Analysis Lab, University of Washington drabas@uw.edu, zhangbao@uw.edu
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#### **DESIGN OF 'SMART' GRASPER ROBOT** FOR TISSUE CHARACTERIZATION

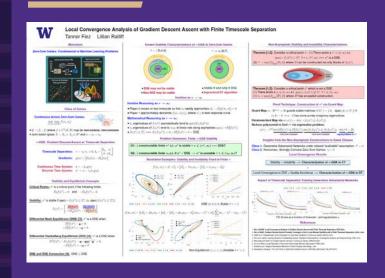




#### **IMPACTS OF TIME-OF-USE RATE CHANGES ON THE ELECTRICITY BILLS OF COMMERCIAL CONSUMERS**



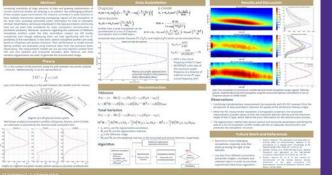
LOCAL CONVERGENCE ANALYSIS OF **GRADIENT DESCENT ASCENT WITH** FINITE TIMESCALE SEPARATION



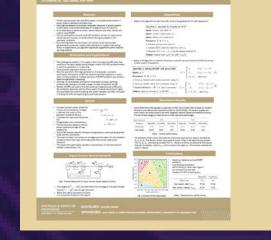


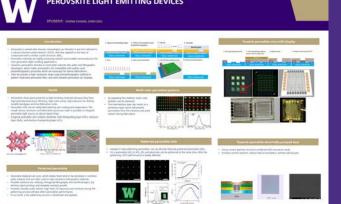
**A DATA ASSIMILATION FRAMEWORK** FOR 2D IONOSPHERIC ESTIMATION

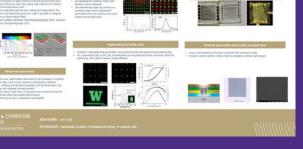




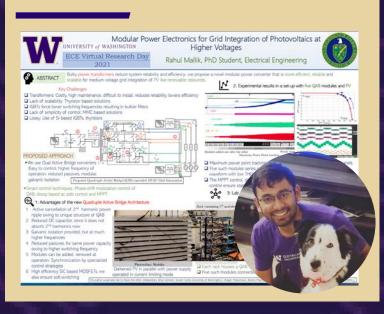
A CONVEX NEURAL NETWORK **SOLVER FOR DCOPF WITH GENERALIZATION GUARANTEES** 







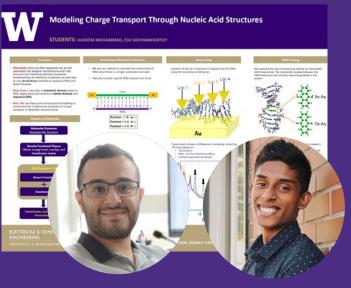




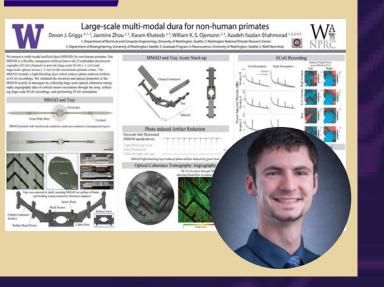
### **ACED: SCALABLE DATA AVAILABILITY ORACLE**

# ACeD: Scalable Data Availability Oracle

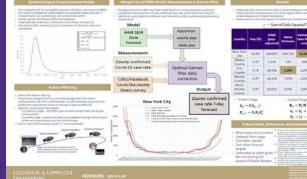




#### LARGE-SCALE MULTI-MODAL **DURA FOR NON-HUMAN PRIMATES**







**AREA AND POWER REDUCTION** 

**TECHNIQUES FOR MM-WAVE PHASED-**

AREA AND POWER REDUCTION TECHNIQUES FOR MM-WAVI PHASED-ARRAY TRANSCEIVER FRONT-ENDS

ARRAY TRANSCEIVER FRONT-ENDS





#### LOCOMOTOR TRAINING FOR PHYSICAL FUNCTION AFTER SPINAL CORD INJURY



**NON-VOLATILE INTEGRATED PHOTONICS** 

**ENABLED BY BROADBAND TRANSPARENT** 

- 😐 :

A 25 MBPS, 12.4 PJ/BIT DQPSK

FOR THE NEURODISC BCI

te (NHP) models require wireless neu ding with a high rate uplink and mini

**BACKSCATTER WIRELESS UPLINK** 

25 Mbps, 12.4 pJ/Bit DQPSK Backscatter Wireless Uplink for the NeuroDisc BC

In Vitro & In Vivo Results

dates & Future Work

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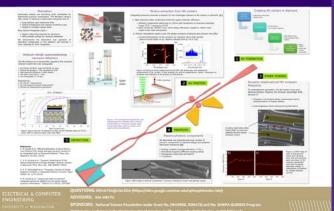
PHASE CHANGE MATERIAL

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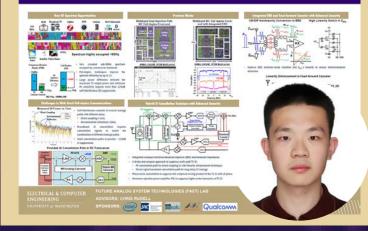
#### NANOPHOTONIC INTEGRATION **OF DEFECT QUBITS IN DIAMOND**

## NANOPHOTONIC INTEGRATION OF DEFECT QUBITS IN DIAMOND

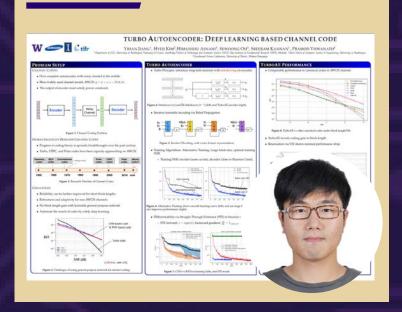


**BROADBAND SELF-INTERFERENCE CANCELLATION WITH ENHANCED** LINEARITY FOR USE IN FULL-DUPLEX TRANSCEIVERS

INEARITY FOR USE IN FULL-DUPLE



#### **TURBO AUTOENCODER: DEEP** LEARNING BASED CHANNEL CODE



#### **AURARING: PRECISE ELECTROMAGNETIC** FINGER TRACKING FOR SMART RINGS



#### A CONTROLLABLE MODEL OF **GROUNDED RESPONSE GENERATION**

MOTIVATION	University of Washington, Microsoft Researce	RESULTS AND ANALYSIS
PROTUNTION       A Boerdst transformers based models can governith instruction of the second sec	Consider Reddi conversation dataset (175 subreddi topicat) Sector and the sector per dialog contrat	Core-Controlled Generation: As different references responses correspond to different gold control phrases, we use single-references evaluation.
	METHODS	Predicted control phrases are independent of reference responses, so we use multi-reference evaluation (maximum score), with up to 5
PROBLEM DEFINITION We introduce a novel framework called controllable grounded response generation (ICGRG)	Control Purase Selection Simulated) User Control: Gold control phrase in the dataset Automatic Control Phrase Predictor: IR-based or finetuned BertQA	Read to Read a present of these to Consult, it is used house a mean state of the s

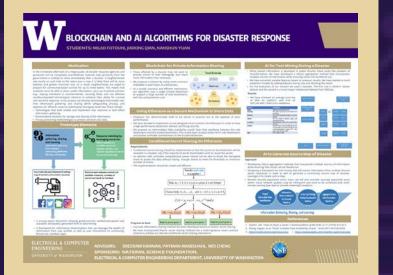
A SINGLE RECIPE FOR ONLINE SUBMODULAR MAXIMIZATION WITH ADVERSARIAL OR **STOCHASTIC CONSTRAINTS** 



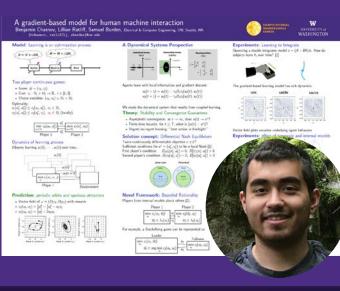




**BLOCKHAIN AND AI ALGORITHMS** FOR DISASTER RESPONSE

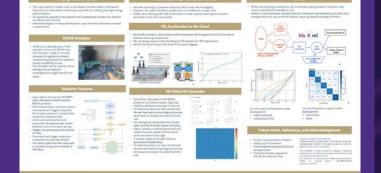






HARDWARE ACCELERATION **APPLICATIONS FOR THE LARGE** HADRON COLLIDER





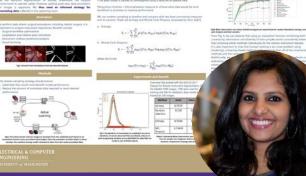


**SCALABLE QUANTUM NANOPHOTONIC PLATFORMS IN NOISE LAB** 

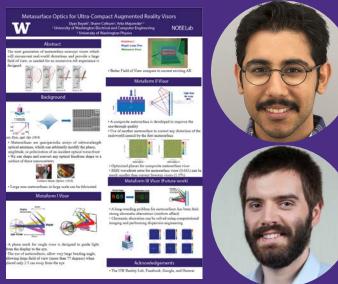


#### **UNCERTAINTY-AWARE SURGICAL INSTRUMENT SEGMENTATION**



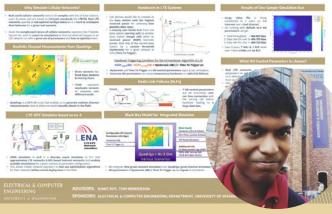


#### **METASURFACE OPTICS FOR ULTRA-COMPACT AUGMENTED REALITY VISORS**



#### **ENABLING 'VIRTUAL REALISTIC FIELD** TRIALS' FOR CELLULAR NETWORKS BY INTEGRATING 'QUADRIGA + Ns-3'







UNIVERSITY of WASHINGTON