De Gruyter Book Proposal

Author: David Blubaugh and Elmo Blubaugh

Operating System: ***Windows***

Typesetting Tool: LaTeX (Changed TO NO: ❌ Camera Ready — De Gruyter will handle typesetting)

Cover Letter Addendum (To Dr. Ranis Ibragimov)

Dear Dr. Ibragimov,

Thank you for your detailed feedback and constructive suggestions. I've incorporated your recommendations into the proposal and am happy to share the revised version below.

Your guidance has been invaluable in refining this project. I look forward to your thoughts! This proposal adheres to the structure and requirements outlined in the original book proposal form, while elaborating on the content, marketability, and unique selling points of the book.

Best regards,
David and Elmo Blubaugh

SUBJECT AREA*

Field: Education, Electronics, Computer Science, Computer Engineering, Electrical Engineering, Computer Programming, Physics, Applied Mathematics, Mathematics, Computer Programming, Hybrid Computing, Analog Computing, Neural Networks, Robotics, Artificial Intelligence, and Generative AI.

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D. Author's / Editor's Bio*

Dr. Elmo Arthur Blubaugh is a highly accomplished industrial consultant and research scientist with over 34 years of experience in advanced sensor technologies, biosensors, and analytical systems. Expertise includes developing miniature wireless chemical and biochemical sensors, embedded software, and managing multidisciplinary projects for federal and industrial clients. At ATR, LLC, designed wireless sensors and software for the chemical and food industries, while at Advanced Technology Research, LLC, led cutting-edge research on optical, nanostructure, and nanoparticle sensors. Directed the development of an implanted glucose sensor at Synthetic Blood International, integrating wireless telemetry for remote monitoring. Holds a Ph.D. in Analytical Chemistry from the University

of Cincinnati, with a focus on biomimetic metal complexes. Authored patents, mentored students, and delivered innovative solutions in healthcare, environmental monitoring, and industrial automation. Continues to explore emerging trends in miniaturized sensors and wireless telemetry, driving advancements in sensor technology.

David Allen Blubaugh is an experienced Embedded Software Engineer and Consultant with expertise in C/C++, Python, MATLAB, and FPGA development, specializing in secure TCP/IP systems and embedded C++ for microcontrollers like the Texas Instruments MSP430. At Advanced Technologies and Resources (ATR), LLC, he integrated ChatGPT with IBM Rhapsody for agile modeling, developed cognitive deep-learning robotic swarms, and designed anti-malware FPGA applications. As an author, he published Intelligent Autonomous Drones by Cognitive Deep Learning, covering AI, UML design, and neural networks for autonomous systems. He has worked on PLC automation, robotics, and sUAS research at Sinclair Community College, focusing on AI-driven drone control and risk assessment. With a master's in electrical engineering from Wright State University, he has contributed to projects for Ford, Schneider Electric, and Xylem, designing PLC systems and automating barcode data integration. His technical skills include MATLAB, Verilog, Linux, and LabVIEW, and he holds a U.S. patent for an innovative wallboard system. He is a U.S. citizen willing to relocate.

Patents by David and Elmo Blubaugh

Gridwall **Patent number:** 6269595

Abstract: A wallboard or drywall system with two types of measuring indicia on on side of the wallboard or drywall, and an integral, transparent vapor barrier is applied to the back side of the wallboard or drywall. In addition, the system contains adhesive coated plastic tape which can be used to seal adjacent, mating edges of wallboard or drywall panels.

Type: Grant **Filed:** May 20, 1999 **Date of Patent:** August 7, 2001

Inventors: David A. Blubaugh, Elmo A. Blubaugh

Glucose sensor **Patent number:** 5964993

Abstract: A sensor that is capable of accurately measuring glucose and other analytes in low oxygen environments is provided. The sensor employs an enzyme-containing membrane comprising a semi-interpenetrating polymer network which is infiltrated by an enzyme. The enzyme-containing membrane increases oxygen transport to the enzyme such that oxygen is not a limiting factor in the oxidation taking place at the enzyme.

Type: Grant **Filed:** December 19, 1996 **Date of Patent:** October 12, 1999

Assignee: Implanted Biosystems Inc. **Inventors:** Elmo A. Blubaugh, Jr., Alan R. Brunsman

Implantable sensor employing an auxiliary electrode **Patent number:** 5914026

Abstract: An implantable sensor comprising a biocompatible electroconductive case which houses a measuring electrode, a reference electrode, an auxiliary electrode, and an electronic circuit for measuring the response of the measuring electrode where the measuring electrode, reference electrode and auxiliary electrode are not in direct electrical contact with one another is provided. The implantable sensor of the present invention is particularly useful as a glucose sensor, especially when an enzyme-containing membrane is included in the measuring electrode.

Type: Grant **Filed:** January 6, 1997 **Date of Patent:** June 22, 1999

Assignee: Implanted Biosystems Inc. **Inventors:** Elmo A. Blubaugh, Jr., Alan R. Brunsman, Kevin L. Houser

Subject Matter of the Proposed Book

A. Planned Book Title and Subtitle:

Title: Generative AI with Analog Computing and Electronics

Subtitle: Circuit Design, Neural Networks, and Intelligent Analog Robotics

B. Edited or ***Authored***?

This work of scientific literature will be the creation of two authors working together to bring this creation to life. THIS will not be a work created by editors. This scientific literature will be an ***AUTHORED*** creation.

C. Brief Description (≤450 characters)

This rigorous book bridges analog circuit design and AI, blending nonlinear dynamics, optimization, and stochastic processes with hands-on experimentation (Flux.ai, Analog Discovery). Covering neuromorphic engineering, robotics, and analog AI, it targets specialists via advanced math (Hamiltonian mechanics, adjoint methods) and hardware validation. Its tool-driven approach competes with high-priced references but does not overwhelm non-experts.

D. Longer Description (≤1,250 characters)

Targeting specialists, this work explores analog computing's role in AI via advanced mathematics and a unique experimental framework: Flux.ai addresses theoretical

challenges (e.g., component tolerance modeling, topology optimization), while Analog Discovery by Digilent empirically validates hardware performance (e.g., transient response, noise robustness). Case studies include energy-efficient robotics and real-time analog AI, combining theoretical foundations (e.g., Hamiltonian mechanics, probabilistic models) with practical techniques like adjoint optimization and SPICE-level simulation. Competes with high-price references in computational physics and neuromorphic engineering by offering a hands-on, tool-driven approach to analog AI design and testing.

E. Special Features

- Combines advanced math, AI, control systems, and electronics into one cohesive textbook
- Practical experimentation with Flux.ai and Analog Discovery
- Focus on low-power, real-time, and intelligent analog systems
- Meets demand for bio-inspired, neuromorphic, and embedded AI
- Ideal for university researcher and student adoption and lab-based instruction

F. Keywords

1. Generalized AI
2. Artificial Intelligence
3. LLM
4. Analog circuit design
5. Control Systems
6. Flux.ai
7. Analog Discovery Module
8. Semiconductors
9. Printed Circuit Boards
10. Electronics
11. Robotics

G. Table of Contents

Chapter Outline

1. Introduction to Electronics *(10 pages)*
2. Mathematics for Electronics *(60+ pages)*
3. Circuit Analysis: Classical and Modern Techniques *(30 pages)*
4. Passive and Active Components *(40)*
5. Transistors and Amplification Networks *(30 pages)*
6. Operational Amplifiers and Integrator Circuits *(60 pages)*
7. Analog Neural Networks *(30 pages)*
8. Analog Network Architectures *(25 pages)*

9. Training Methods for Analog AI *(25 pages)*
10. Hardware Implementation of Neural Systems *(30 pages)*
11. Flux.ai-Driven Design and Optimization *(20 pages)*
12. Control Theory and Robotics *(30 pages)*
13. Nonlinear Dynamics and Real-Time Systems *(25 pages)*
14. Real-Time Analog AI for Robotics *(30 pages)*
15. Stochastic and Probabilistic Methods *(20 pages)*
16. Emerging Trends and Hybrid Systems *(20 pages)*
17. Ethics, Safety, and Human Oversight in Hardware AI *(10 pages)*
18. Hands-On Experiments and Projects *(40 pages)*
19. Conclusion and Research Outlook *(10 pages)*

H. Potential and Valid Reviewers

Salim Perchy, Michael Findler, Dr. Moez, Donald McLemore, and Walter Van Der Heiden

I. Series

Not Known at this time. We require more Information from De Gruyter to decide.

MANUSCRIPT INFORMATION

A. SCHEDULE

The book will take approximately 10 months.

B. TYPE OF MANUSCRIPT

The manuscript and all related information will be sent to De Gruyter by ***Microsoft Word Document***.

We will be using ***Microsoft Windows Operating System***.

NO, to submit our manuscript camera ready.

C. ESTIMATED PAGE COUNT*, FIGURE COUNT, AND TABLE COUNT

Manuscript Physical Description:

- Manuscript Type: Camera Ready (De Gruyter will typeset)
- Estimated Page Count: 600
- Figures: 150 (grayscale; selective color only where essential)
- Tables: 30 (black and white or color)
- Index: Yes

-Suggested Price: ~$165.00

MANUSCRIPT MARKET POSSIBILITIES:

A. TARGET GROUPS:

- Bachelor's and Graduate-level students and researchers in electrical engineering, control theory, AI, and robotics
- Professors seeking modern interdisciplinary course materials
- Engineers transitioning from digital to hybrid/analog AI systems
- Robotics designers and embedded systems developers

B. Competing Publications & Differentiators

Title	Author	Year	Publisher	Price	Difference
Analog and Hybrid Computer Programming ISBN-13 978-3110787597 Pages: 314 Softcover	Bernd Ulmann	2023	De Gruyter	$45	Lacks modern AI focus or real-time control integration

Robotics, Vision and Control: Fundamental Algorithms in Python ISBN-13 978-3031064685 Pages: 850 Hardcover	Peter Corke	2023	Springer	$42	Outdated, no circuit design tools
Bio-Inspired Artificial Intelligence ISBN-13 978-0262062718 Pages: 659 Hardcover	Dario Floreano	2008	MIT Press	$70	High-level theory, no hands-on or analog electronics
Neuromorphic and Brain-Based Robots ISBN-13 978-0521768788 Pages: 376 Hardcover	Jeffrey L. Krichmar	2011	Cambridge University Press	$160	Focuses on biology-to-chip, lacks math rigor and practical robotics
Biomedical Electronics, Noise Shaping ADCs, and Frequency	Pieter Harpe	2024	Springer	$85.0	Technical circuits, no AI/neural or robotics integration

ISBN-13

978-3031289118

Pages: 354

Hardcover

C. DIFFERENTIATORS THAT MAKE OUR BOOK UNIQUE:

- Practical focus using Flux.ai for optimization & Analog Discovery for real-world validation
- Strong emphasis on theoretical depth + experimental learning
- Full-spectrum integration of AI, analog design, and control theory IN ONE SOURCE.

D. CRITICAL DISTINGUISHING FEATURES

- Combines advanced math, AI, control systems, and electronics into one cohesive textbook
- Practical experimentation with THE REVOLUTIONARY Flux.ai and Analog Discovery MODULES FROM NATIONAL INSTRUMENTS.
- Focus on low-power, real-time, and intelligent analog systems
- Meets demand for bio-inspired, neuromorphic, and embedded AI
- Ideal for university researcher and student adoption and lab-based instruction