Dr. Anthony Menicucci, PhD-Engr.

Curriculum Vitae
1 University of New Mexico, Department of Mechanical Engineering
Redondo Drive, Building 122, MSC01 1150
Albuquerque, NM 87131
amen@unm.edu; https://www.unm.edu/~amen/, https://armatech.us/

RESEARCH INTERESTS:

- Artificial Intelligence, Deep Learning, Machine Learning Neural Network & Reinforcement Learning theory design, development & implementation.
- Applied Mathematics, Statistical Signal Analysis including Fuzzy Logic and Chaos theory as applied to stochastic process', and Regression.
- Artificial Intelligence applications relating to predicting Agricultural Industry product metrics, crop prices, yields & longer-term weather trends utilizing proprietarily developed inputs. AI applications predicting instrument prices and valuations in the Equities, Debt & Futures markets with an emphasis on identification of anomalies relative to underlying trends. AI applications to hyperspectral imaging.
- Predictive linguistics, linguistical mining and contextual emotive parsing with deep learning and other Machine Learning techniques
- Artificial Intelligence applications, project quantification & implementation specialist.
- Solar Irradiance Micro-Forecasting (SIMF) & Solar Forecasting utilizing AI for grid sized energy storage conditioning and reduction of storage-infrastructure wear and tear.
- Large and Medium solar photovoltaic grid, microgrid and grid sized energy storage integration, utilizing supply & demand response techniques.
- Particle Image Velocimetry (PIV) and Finite Element Analysis (FEA) techniques.
- Building energy use and energy control systems analysis. Building pre and post energy analysis from retrofit/upgrade HVAC designs. Sustainable building design and construction with Smart Grid integration.
- Product development for both Plastic Injection Modeling and traditional products including feasibility, product strength/resiliency (including FEA & 3D printing) and marketing analysis.
- Development and transformation of product differentiated value propositions and subsequent patent claims drafting to solidify patent uniqueness defensibility in court, with an emphasis on product functionality.
- Software development techniques including SCRUM (sprint-based), Agile (ticked-based) & Basecamp (goal-oriented). Unit Testing advocate.

EDUCATION:
GPA 3.8 / 4.0
- PhD – Engineering (Mechanical Engineering), University of New Mexico, Dissertation title: Solar Insolation Micro-Forecasts Using Longwave Infrared Sensors and Artificial Intelligence   Summer 2020
- BS - Applied Mathematics   Fall 2008
  BS minor – Distributed in Mechanical Engineering   Fall 2008

TECHNICAL PROFICIENCIES AND SKILL SETS:
- Expertise in: Microsoft OFFICE, SOLIDWORKS, MATLAB, 3D Printing Technology
- Proficient in: Computer Aided Design (CAD), Finite Element Analysis (FEA), Particle Image Velocimetry (PIV), AutoCAD, FLOW-3D, PTC CREO, PIVLab, FIELDVIEW, G-Code Programing, Raspberry Pi and Arduino, CCD/CMOS/NIR/FIR cameras, THINKORSWIM, ACTIVE TRADER PRO, RS MEANS COSTWORKS, C++ in both Windows and Linux, PYTHON, HTML
- Proficient in: Six Sigma Manufacturing, ISO standards & machining/milling techniques, single family home building/renovation
- Experience in: systems programming for embedded controllers and LAN communications, CUBIT, PARAVIEW, TRNSYS, Java
- Over 16 years of experience in Mechanical/Civil Engineering and Construction Management experience including all trades in the construction field, as well as Mechanical and Power Engineering design
- Over 8 years of experience in Plastic Injection Mold and Product design with local PIM manufacturers
- Over 8 years of experience in Artificial Intelligence and Machine Learning

WORK EXPERIENCE:
Research Assistant Professor (LAT)   Fall 2020 – Present
University of New Mexico, Department of Mechanical Engineering, Center for Emerging Energy Technologies (CEET) & UNM Rainforest Innovation (STC)
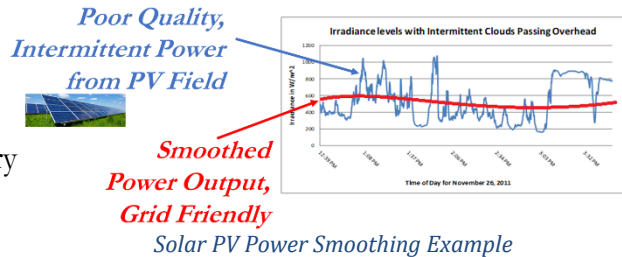Current and ongoing research activities are as follows:

- Commercialization and field trials of Cloudshine© through UNM Rainforest Innovation: Cloudshine© is a product that provides a 5 to 10 minute predictions of cloud occlusion over individual solar electric panels (photovoltaic, PV) so electric utilities,

Clockwise from top left; UNM, UNM Mechanical Engineering, UNM Rainforest Innovation (formally STC) & Center for Emerging Energy Technologies (CEET)

Independent Service Operators and Regional Transmission Organization (ISOs/RTOs) can:

    a) Enable solar PV power grid integration, especially in microgrid applications, by smoothing high frequency dense cotton-ball looking cloud occlusions from cumulus and stratocumulus clouds;

    b) Reduce the cost by reducing the discharge rates and size of flywheel and other fast acting energy storage systems by 33%+ & 27%+;

    c) Prepare for the coming voltage and frequency spikes/dips;

    d) Meet their Renewable Portfolio Standards (RPS) legislation;

    e) Arbitrage the spot market;

    f) Ultimately, incur less regulatory fines and;

    g) Enable Solar PV now.

Poor Quality, Intermittent Power from PV Field

Smoothed Power Output, Grid Friendly

Solar PV Power Smoothing Example

https://www.armatech.us/Investment/Startup/SIMF/ This effort is assisted through STC under the patent numbers 10,345,486 & 9,921,339 and was a result of the PhD from Dr. Anthony Menicucci (Su. 2020).

- I-Corp Participation (Sp./Su. 2020): The I-Corp program assisted the commercialization efforts of Cloudshine® by focusing on the value propositions of the product. Each participant utilized an STC assigned mentor and the Business Model Canvas outline to formulate a business plan, make a 90 second pitch and produce a 10-minute video summary pitch of the product. The program is approximately four months long and prepares participants for understanding what they need to know to help launch a product.

- Ongoing Research into COVID-19: As a participant in the Governor's NM Covid-19 Modeling Board, research is underway to identify the variables that steepen or flatten the Case Fatality and Case Hospitalization Rates (CFRs/CHRs) of virus victims. These variables are identified with LAPART, a form of neural network that is tuned to identify anomalies. This data is used to make the COVID-19 model predictions more accurate.

- Ongoing Research into identification of cell parts from hyperspectral images: Research is underway to identify cellular components directly from the full spectral response. Current statistical techniques can identify differences between cellular compounds, but has trouble identifying the actual compound from a known reference. LAPART and other Neural Networks are being utilized to investigate their identification abilities. This is a cross-collaborative research initiative with the Department of Biology and the Department of Mechanical Engineering.

- Future Activities include the following:

    a) Commercialization of ME Design projects with Anderson School of Management and STC Rainforest Innovation.

b) Applications of LAPART to radar and satellite data to predict specific regional areas that will receive ground fall precipitation within a 20 min. to 2-hour prediction horizon.

The University of New Mexico, http://www.unm.edu/
UNM, Department of Mechanical Engineering, https://me.unm.edu/
Center for Emerging Energy Technologies, https://ceet.unm.edu/
STC, Rainforest Innovations, https://innovations.unm.edu/
    Albuquerque, NM

Owner and Founder   Jan. 2016, filed: November 2019 – Present
ArmaTech LLC
ArmaTech LLC is an engineering systems and product design and development company. It specializes in merging neural network (AI) theory and application with real world problems, to realize solutions. ArmaTech also develops machined parts, as well as plastic injection molded products, with services ranging from CAD design and FEA to product marketing and patent development. The following are a few of the current activities underway:

- Agricultural Industry Applications, (specifics redacted for proprietary reasons):
    a) Utilizing AI and proprietary input data to predict farmed product biomolecules content, such as protein and carbohydrates, of various US grown products.
    b) Utilizing AI and proprietary input data to predict farmed product prices, price spreads relative to variation of product and volume of harvests in the future.
    c) Utilizing AI to predict long term weather trends and their impact on the farmed product chemical content of various US grown products.
- Product Development of Plastic Injection Molding (PIM) Products: Working with Accurate Machine and Tool Co. Inc., the owner has developed several currently marketed PIM products. Among those products are;
    a) A multi wine and glass bottle holder to replace expensive cardboard packaging for pallet transport currently in Patent Pending with STC at UNM.
    b) A new bike rack holder for bike delivery food services like Uber Inc. or Lyft Inc.,
    c) A quick access lock box to prevent unauthorized use of protective equipment that is cost effective and PIM.
    d) A novel takeout cup holder that is PIM and satisfies the tamper-proof capabilities required for food delivery services.
    e) An Optic Shroud to enhance robustness of various hunting and military applications.

- COVID-19 Response: In 2020 ATL designed multiple Personal Protective Equipment (PPE) products including face masks and face shield options to help prevent the spread of the corona virus. By utilizing a plastic injection molding process, ATL was able to design masks that minimize the use of filter material, while maintain extremely large production quantities. These products went into production in mid-2020.

Plastic Injection Molded Masks and Face Shields

- CAD and FEA services: ATL is actively marketing basic and advanced CAD and FEA services for all clients.
- Algorithm Development and Research: In 2018, ArmaTech LLC has developed an artificial intelligence process called the Hyper Parameterized Temporally Aggregated Non Convergent Artificial Intelligence Multi Clustering Interrogation Prophecy Algorithm (HPTANCAIMCIP_Algo.). This process combines multiple Neural Network algorithms and traditional statistical methods to identify persistent anomalies in market data over multiple years. This algorithm is applied to the Equities and Futures markets including gold and bitcoin. When used as a quantitative and derivatives strategies methodology, it is particularly useful in identifying abnormal conditions.
- Security Products Development: ArmaTech has developed several security products that have emerged from the newly cost-feasible technology the owner used for their PhD. This technology has seen a dramatic reduction in price over the time frame of 2010 – 2015 and offers not only increased security but also failsafe privacy even if the security system is compromised by being hacked. These security products integrate a neural network in the future and are preferential for in-home/in-business monitoring where privacy and accuracy are a priority. Perimeter security for advanced warnings of intrusion detection is also greatly increased for outdoor security monitoring.
- Building Energy Analysis and Subsequent HVAC System Retrofits: ArmaTech is actively marketing to seek contracts with building owners, managers and operators to quantify the current energy use in their building and then suggest cost effective HVAC upgrades for savings. After the implantation of such upgrades, ArmaTech goes back to quantify the building energy use and make a TRNSYS model of the current HVAC operations as a baseline model for future comparison of the health of the building.

ArmaTech LLC
Albuquerque, NM 87106
https://armatech.us

Plastic Injection Molding designer   January 2014 – November 2019
Independent Design Contractor

Independent contractor with Amscan Custom Injection Molding Inc. and Accurate Machine and


Left to right: Harley Horn Cover, Four pack soda holder, Baby sensory device, Ramen noodle spork

Tool Co. Inc, both located in Los Lunas, NM, to assist clients in bringing their Plastic Injection Molding (PIM) products to a design state that is feasible. Often, the client did not have a CAD design, or the CAD design was not moldable. In each case, work duties included complete CAD redesign with functionality in mind. Often, FEA was needed. In other cases, the owners had good ideas for products that they wanted developed because they knew of potential untapped markets but did not have the time for an iterative product design process. A few examples of patented/patent-pending and/or completed and sold/selling products are shown.

Mechanical Engineer Graduate Student Employee   Nov 2009 – Jan 2015
Sandia National Laboratories, New Mexico

- Sierra Mechanics: Department 6123 is the structural dynamics department in the Computational Systems & Software Environment program. It builds high performance, computational systems to address the simulation needs for the nation's nuclear stockpile under the
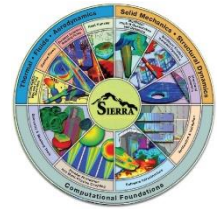
Sandia National Laboratories and Sierra Mechanics

Advanced Simulation and Computing's (ASC) initiative. It was tasked to develop massively parallel computer simulation code to utilize the supercomputers of the time, for thermal, fluid, aerodynamics, solid mechanics and structural dynamics. Duties included: Worked as a C++ programmer in Linux, in a group team-room setting to, develop the FEA code Salinas-Sierra Mechanics, for structural dynamic simulations on massively parallel supercomputers. Utilized the SCRUM team-project management method. Developed an intuitive and easy to use outreach toolset for Sandia members of the technical staff to use, as an end to end guide for utilization of Sandia's massively-parallel supercomputers. Also, developed code and committed changes to the Salinas toolset as well as implemented additional nightly and hourly build tests.

- National Solar Thermal Test Facility (NSTTF): The NSTTF was tasked to provide experimental data on the design and construction of various proposed solar thermal electrical plants intended for large-scale power generation known as solar power towers. It resides under the Concentrating Solar Power (CSP) program. The CSP program at Sandia was tasked to conduct research of new concentrating technologies.

  Clockwise from top left, Stirling Engine Parabolic Dish, NSTTF Power Tower Field, Mode 5 Simulation of a Model Heliostats and Heliostats In-Use at the NSTTF

  Duties included: Dynamic modeling of heliostat fields utilizing Sandia's massively- parallel supercomputer structural dynamics code, Salinas-Sierra to identify winds induced modal distortions and magnitudes. The results were then compared to dynamic testing and other FEA codes. Heliostats are large sun-tracking mirror holders, around 25 ft. tall, that reflect sunlight back to a central receiver power tower. Duties also included, utilizing the solar furnace variable concentrating dish to quantify the change of spectral absorptivity, in new selective absorbers for central-receiver power towers, by exposing them to repeated concentrated sunlight. Lastly, assistance was rendered on the Sunshine to Petrol project, directly assisting in the setup of the experiment at the solar furnace. The Sunshine to Petrol project sought to utilize solar thermal energy to recombine gaseous carbon dioxide, with hydrogen from water, to form a fuel similar to gasoline, that can be used in current internal combustion engine vehicles.

- Energy Storage Systems (ESS): The ESS program was formed to develop energy storage technologies and systems.

  Duties included: Assisting with research and witting reports, 'Methodology to Determine the Technical Performance and Value Proposition for Grid-Scale Energy Storage Systems' and 'DOE/EPRI Electricity Storage Handbook in Collaboration with NRECA'. Conducted additional research in the field of power system economics and the design of efficient markets for electricity purchase, to better support proposed value propositions for grid connected energy storage economic analysis.

- Distributed Energy Technologies Laboratory (DETL): DETL is responsible for the study and integration of emerging energy technologies into new and existing electricity infrastructures.

  Duties included: Assisted DETL in their research on cloud occlusion micro-forecasts with the use of a Total Sky Imager (TSI). Provided consultation and research about the different approaches taken by DETL, the University of New Mexico and University of San Diego for cloud occlusion micro-forecast work. Assisted DETL with solar irradiance cloud occlusion micro-forecasting with the TSI.
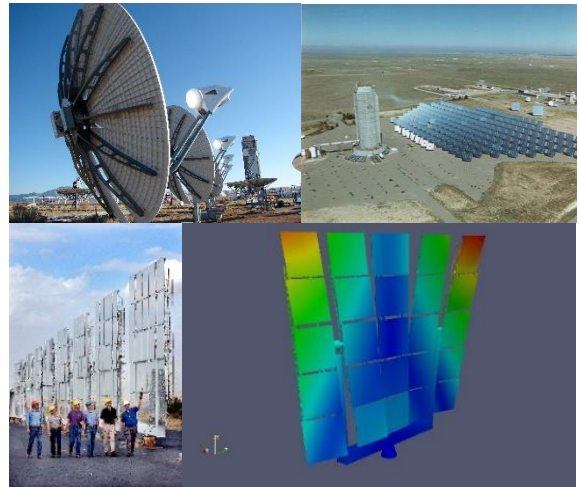
- Water Power: Duties included: Multiple CAD design work for various water energy harvesting technologies.
- Facilities: Facilities is responsible for the daily operations and comfort of all employees through the efficient operations of building HVAC systems. Duties included: Direct site visitation and evaluation of HVAC equipment that needed to be replaced and subsequent biding of the replacement cost within a high security area utilizing RS MEANS Costworks. The average bid size was $250,000 per item. Assisted in various diagnostic testing of problem equipment like water boilers and chillers. Formulated blowdown plans for various Assisted in organizing a proposed demand response event at Sandia for various smart-grid, LEED-certified, buildings.

> Sandia National Laboratories
> Albuquerque, NM 87185

Research Assistant, PhD Mechanical Engineering   Spring 2012 – Summer 2020
University of New Mexico and the Center for Emerging Energy Technologies (CEET)

Duties included: Research, conduct experiments and write up the results of testing done on cloud occlusion solar micro-forecast technologies, as well as make a prototype for field development. Various technologies were utilized, including newly cost-feasible camera technology that increased the accuracy of

UNM and the Center for Emerging Energy Technologies at UNM

predictions by enhancing contrast. Legacy camera technology was compared to these new results. Multiple PIV algorithms were employed to compare results of different vector flow fields. Multiple prototypes were designed, 3D printed and deployed into the field across three states, including one site at Mes Del Sol's microgrid and energy storage technology test facility, located in south Albuquerque, NM. An NSF SBIR stage I grant was written and funded to complete this PhD research. Two patents were written and received for this novel technology through the Science and Technology Center (STC) at UNM. The exclusive licensing agent, Microgrid Labs (MGL) partnered with UNM and STC to develop this technology.

Lecturer, ME 317 (Fluid Mechanics)   Spring 2020
Lecturer, ME 306 (Dynamics)   Summer 2013 – 2015
Lecturer, ME 160 (Mechanical Engineering Design I)   Fall 2016
University of New Mexico, Albuquerque, NM
Duties: Full lecturer for Mechanical Engineering 317L, Fluid Mechanics; Mechanical Engineering 306, Dynamics; and ME 160L Design I. Held office hours for students, assigned and graded homework, formulated tests and quizzes and assigned grades.

Teaching Assistant ME160L (Mechanical Engineering Design I)   Fall 2015 – 2017

Teaching Assistant, ME217 (Energy, Environment and Society)   Fall 2013
Teaching Assistant ME360L (Mechanical Engineering Design III)   Spring 2013
Teaching Assistant ME320L (Heat Transfer)   Spring and Fall 2009
University of New Mexico, Albuquerque, NM
Duties: Lectured on relevant topics discussed in class as a recitation. Ran and facilitated the experiments for the undergraduate Mechanical Engineering 320 Lab also known as "Heat Transfer" at the University of New Mexico. Wrote tests and quizzes to assess the knowledge base and retention of students for Mechanical Engineering 160L, 217 and 360L. Graded class homework and reports. Maintained office hours for student questions. Wrote and held reviews for class subjects and upcoming tests.

> The University of New Mexico
> Department of Mechanical Engineering
> Albuquerque, NM 87131

3D Printing and Engineering Design Entrepreneur / Co-founder   July 2013 – July 2016
Fuse Industries LLC
Company specialty: Full-service 3D printing and design company for products geared towards entrepreneurs and inventors. We helped clients bring their ideas to life through an iterative, methodological and comprehensive design process that includes 3D printing. Full-service engineering includes, Finite Element Analysis, general design, materials and process manufacturing analysis, as well as others. We also help formulate patent claims on products to lower the client's patent attorney costs and maximize client's protection.

> Fuse industries LLC
> Albuquerque, NM 87104

Engineering Designer / Entrepreneur / Co-founder   July 2012 – Present
Mobile Muscle LLC
Mobile Muscle is a full-body workout device which focuses on cardiovascular and strength training designed by Anthony Menicucci and Landon Joost. It is designed as a simple and compact, universal, all-in-one substitute gym barbell, gym dumbbell, and gym cable system that also can perform cardiovascular exercise. Mobile Muscle has been patented and is in the marketing stage of development and is ready to sell.

> Mobile Muscle
> Albuquerque, NM 87106

C++ Programmer / Electrical Engineer Intern   March 2008 – December 2008
L-3 Communications (Jaycor division)

Company background: One of the projects L-3 Communications was engaged in, was a subcontract with Science Applications International Corporation (SAIC) and the Air Force Research Laboratory (AFRL) to develop a mobile counter-IED system

L3 Communications Inc. and the similar Navy NIRF vehicle

that uses High Power Microwaves (HPM) directed energy to neutralize IEDs. It is like the Navy's Neutralizing IEDs with Radio Frequency (NIRF) program as shown in the figure above. Of the total $30M program, L-3's contract responsibilities were the development of the control system in C++ and the assembly of the microwave generation and antenna apparatus.

Duties included: Systems programmer for L-3's Applied Technologies Jaycor division. Primary responsibilities were developing real-time, object-oriented control software for stepper motors, power supplies, digitizers and specialized hardware deployed across several networked, embedded PC-104 controllers.

> L-3 Communications, Jaycor
> Albuquerque, NM 87107

Mechanical / Process Engineering Intern / Business development   May 2007 – Oct. 2008
Alion Science and Technology

Duties: Helped analyze and conduct experimental simulations of catastrophic event failures for various Nuclear Power Plants in and out of the United States including "Three Mile Island"; primary focus of work was on loss of inner containment coolant

and a probabilistic risk assessment (PRA) fire analysis of the subject Power Plant; additional work included business development for a more diversified client base.

> Alion Science and Technology
> Albuquerque, NM 87110

President / CEO / General Contractor   March 2006 – May 2018
AM Contractors Inc.

Company specialty: Developing unique solutions to diverse problems involving engineering and construction of residential and small commercial properties.

Accomplishments: Eight contracted construction jobs (remodeling, plumbing, framing, etc.), gross sales to date ~$500,000.

> AM Contractors Inc.
> Albuquerque, NM 87104

Vice President / General Contractor   June 2009 – May 2015
Green Spaces Inc.
Company specialty: Complete Green; Construction,
Construction Management, Remodeling, Mechanical
engineering (HVAC) energy analysis, Civil Engineering and building/remodeling
consultation of both commercial and residential properties.
       Green Spaces Inc.
       Albuquerque, NM 87120

Optimization Engineer / Assistant to the Chief Geologist   June 2006 – September 2006
Reserve Silica, Inc., Albuquerque, NM and Ravensdale, WA
Duties: Analyzed sand processing and mining plant operations for
cost-effective improvements in "high-wear" areas; Implementation of
analysis saved the company approximately $150,000/year.
       Reserve Industries Inc.
       Albuquerque, NM 87102

Entrepreneurship and Employment Duties as a Minor, (Included for Completeness)

Maintenance Man   Summer months of: May 2000 – August 2005
St Charles Borromeo School and Church
Duties: Various handyman specialties, including but not limited to lawn cutting, concrete
work, painting, framing, plumbing, installing fixtures, staining, yard work, sprinkler work,
stucco, drywall and various other construction trades
       St. Charles Borromeo School
       Albuquerque, NM 87106

Sole Proprietor   January 1994 – March 2006
Handyman, Albuquerque, NM
Duties: Various handyman specialties, including but not limited to lawn cutting, concrete
work, painting, framing, plumbing, installing fixtures, staining, yard work, sprinkler work,
stucco, drywall, backhoe operations, bobcat operations and various other construction
trades.

Luminaria Supplier   Winter months of: 1990 – 2014
Anthony's Specialty Luminarias, Albuquerque, NM

Company background: Originating out of a primarily catholic tradition, luminarias, shown to the left, are small dirt filled bags, illuminated with a candle and set out in front of one's house primarily on Christmas Eve for a variety of reasons. One such idea was to directly give Mary and Joseph (as in the parents of Jesus back in the day) an illuminated path to vacant

Luminarias

housing for which they may commence the birthing process. Whatever the origins, living near the "Albuquerque Luminaria Tour", which was a city organized effort to get homeowners to display hundreds of thousands or luminarias along a certain route of neighborhoods, I was able to fill this need once a year and make some Christmas money. Duties: I either directly engaged in and or delegated tasks that included the following: Folding bags, filling bags with dirt, placing candles in bags, transportation of luminarias to clients houses on or before Christmas Eve, setting up luminarias, lighting the candles, taking down luminarias on Christmas day, delegating tasks, buying inventory and delegating work to others among other duties. In 2009 I employed 8 neighborhood kids and set out 9,000 luminarias in one day.

LICENSES & PROFESSIONAL AFFILIATIONS:
- American Association of Individual Investors (membership 2016-2019)
- General Building Contractor, State of New Mexico. (exp. License # 93937)
- Member, ASME (exp. membership # 9394404)
- Member, IEEE Inc. (exp. membership # 80699953)
- Member, ICC (exp. membership # 5295213)
- General Class Ham Radio operator, (exp. Call Sign KD5MHT)
- Dean's List recipient, Spring 2008

BOARDS, COMMITIES AND COMMUNITY OUTREACH:
- Board member and contributor to NM COVID-19 Modeling Working Group (MWG); The COVID-19 MWG is a group of scientists, researchers and health professionals form Los Alamos National Laboratories, Sandia National Laboratories, Presbyterian Health Services and the New Mexico Department of Health that model and predict new cases of coronavirus infections and transmission rates around New Mexico. As a board member, instead of taking a deterministic approach to modeling with an SIR model, I applied Artificial Intelligence (AI) and Machine Learning (ML) techniques to identify variables that flatten or steepen the infection curve.

  Q1 2020 – Q1 2021
- National Science Foundation Research Experience for Teachers (NSF RET); Volunteer outreach, meeting twice a weekly for four months in the summer semester in order to help two teachers, one teaching 6th grade at Van Buren Middle school and

the other instructing 10th grade, to adapt my PhD research for topics that they can implement in their classrooms. Typically, the teachers would follow me around at UNM, ask non-stop questions all day, then go away write classroom curriculum plans for their class, come back and repeat, starting with questions about the curriculum plans that they wrote the day before.   2013 – 2017

- Selection Board Committee Member, Graduate Representative, Committee member to recommend selection of the next Mechanical Engineering Chairperson; Chris Hall selected.   Fall 2010
- Selection Board Committee Member, Graduate Representative, Committee member to recommend selection of a new Mechanical Engineering faculty member; Asal Naseri Kouzehgarani selected.   Spring 2013
- Selection Board Committee Member, Graduate Representative, Committee member to recommend selection of a new Mechanical Engineering faculty member; all candidates were rejected.   Spring 2016
- Captain; Mechanical Engineering Graduate Association. (MEGA UNM)
                                                                        2010 – 2014 & 2019 – 2020
- Science Fair judge; Regional Science Fair (formerly the Annual Central NM Science & Engineering Research Challenge (formerly the NWNM Regional Science & Engineering Fair))   2010 – Present
- Science Fair judge; Van Buren Middle School (formerly the "nice but, you need more than 1 trial fair" Spring months, typ. in March)   2013 – 2016
- Science Fair judge; Various Middle Schools around the state including some dirt road rural areas. (aka the "nice but, that's not a hypothesis Fair")   2002 – 2005

FIRST AUTHOR AND CONTRIBUTING AUTHOR PUBLICATIONS (in order of precedence first then by date):

1. A. Menicucci, board members: A. Mammoli, P. Vorobieff, S. Poroseva, T. Caudell, M. Martinez-Ramon, Solar Insolation Micro-Forecasts Using Longwave Infrared Sensors and Artificial Intelligence, PhD dissertation July 2020

2. A. Menicucci, D. Menicucci, A. Mammoli, H. He, "Analysis of the Accuracy of Using Solar Tank Energy Factor for Estimating Savings in Fielded Solar Hot Water Systems" American Solar Energy Society, ASES Conference, 2013

3. A. Menicucci, C. Ho, D. Griffith, "High Performance Computing for Static and Dynamic Analysis of Heliostats for Concentrating Solar Power" American Solar Energy Society, ASES Conference, 2012

4. A. Menicucci, G. Reese, M. Bhardwaj, B. Drissen, K. Pierson, T. Walsh, "Salinas-Tutorial, From Cubit to ParaView" Albuquerque, NM; Sandia National Laboratories, SAND2010-2230P, April 2010

5. D. Menicucci, A. Menicucci, "COVID-19 models were right, but assumptions weren't" Albuquerque Journal, Albuquerque, NM; September 2nd 2020

6. A. Mammoli, G. Serrano, A. Menicucci, T. Caudell, M. Martinez-Ramon, "An Experimental Method to Merge Far-Field Images from Multiple Longwave Infrared Sensors" Solar Energy, April 2018

7. A. Mammoli, A. Menicucci, A. Ellis, T. Caudell, S. Willard, J. Simmins, "Low-Cost Solar Micro-Forecast for Improving the Efficiency of PV Farm Output Smoothing" Institute of Electrical and Electronic Engineers Sustainable Technologies, IEEE SusTech, conference, 2013

8. D. Menicucci, T. Caudell, A. Menicucci, "Preliminary Results from the Application of Adaptive Resonance Theory to Identify the Operational Status of Solar Hot Water Systems Based on Smart Meter Whole-House Energy Records" American Solar Energy Society, ASES Conference, 2013

9. J. Diaz, D. Menicucci, T. Caudell, A. Menicucci, "Solar Water Heating System Production Analysis" Arizona Public Service Company, April 2013

10. D. Griffith, C. Ho, P. Hunter, J. Sment, A. Moya, A. Menicucci, Modal Analysis of a Heliostat for Concentrating Solar Power; Topics in modal analysis I: proceedings of the 30th IMAC, a conference on structural dynamics, 2012, Allemang, Randall, Springer, 2012, P.415-423

11. D. Lincoln, A. Menicucci, A. Mammoli, "Energy Price Controlled Automated Demand Response Applied to the University of New Mexico Campus" Grid-Interop Forum, 2010

CONTRIBUTING AUTHOR OR CONTRIBUTING WORK PUBLICATIONS

1. Abbas A. Akhil, Georgianne Huff, Aileen B. Currier, Benjamin C. Kaun, Dan M. Rastler, Stella Bingqing Chen, Andrew L. Cotter, Dale T. Bradshaw, and William D. Gauntlett, DOE/EPRI Electricity Storage Handbook in Collaboration with NRECA, Albuquerque, NM; Sandia National Laboratories, SAND2015-1002, February 2015

2. R. Byrne, B. Buckner, M. Donnelly, D. Trudnowski, A. Menicucci, "Methodology to Determine the Technical Performance and Value Proposition for Grid-Scale Energy Storage Systems" Albuquerque, NM; Sandia National Laboratories, SAND2012-10639, December 2012

3. D. Lincoln, C. Evans, "Demand Response Pilot Events Conducted August 25, 2011 and August 9, 2012 Summary Report" Albuquerque, NM; Sandia National Laboratories, SAND2012-10323, Janurary 2012

PATENTS OR PATENT PENDINGS HELD

1. Patent Pending Q1, 2021; "COMPOSTABLE PLASTIC INJECTION MOLDED SMALL, MEDIUM AND LARGER CUP AND DRINK CARRIER FOR IN-STORE, TAKEOUT AND TAMPER-RESISTANT PACKAGING INTEGRATION"

2. Patent Pending Q1, 2021; "RECYCLABLE PLASTIC INJECTION MOLDED WINE AND BOTTLE STACKER FOR PALLET TRANSPORTATION"

3. "APPARATUS AND METHOD FOR SOLAR ENERGY MICRO-FORECASTS FOR SOLAR GENERATION SOURCES AND UTILITIES"
   Patent Number: US 10,345,486 B2; Issued *Jul. 9, 2019.

4. "APPARATUS AND METHOD FOR SOLAR ENERGY RESOURCE MICRO-FORECASTS FOR SOLAR GENERATION SOURCES AND UTILITIES"
   Patent Number: US 9,921,339 B2; Issued *Mar. 20, 2018

5. "FULL BODY RESISTANCE STRENGTH AND CARDIOVASCULAR MOBILE EXERCISE DEVICE" Patent Number: US 2014/0342883

GRANTS, CONTRIBUTING AUTHORSHIP

1. NSF 15-604, "Increasing Onsite PV Consumption by Solar Irradiance Microforecasting" Funding Status: not funded

2. NSF 16-555, "STTR Phase I: Solar Irradiance Microforecasting" Funding Status: 2017-2018

TALKS GIVEN

1. "20160916_Crash Report; Silver, Gold, Land, Derivatives, Stocks, Bonds, Inflation, Trends, Cycles, Employment, Exchange Rates, Credit Analysis, Predictions and Everything you ever wanted to know",
   American Association of Individual Investors, Albuquerque, NM; September, 2016

2. "Automated Trading, Artificial Intelligence, Cryptocurrencies, Killer Robots and the Real Threat to Humanity's Existence" January, 2018
   American Association of Individual Investors, Albuquerque, NM; September, 2016