

# Lyman Moreno

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## Professional Summary

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A highly determined and hardworking professional that continuously strives to improve oneself and others. I have gained more than 15 years of learning and experience in the academic and research worlds including management and product development in the industry.

## Work Experience

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### Owner-operator

Apr 2021 – Present

Vertfarms YXE, Saskatoon, Saskatchewan, Canada

- Manages operations, research and development, sales, marketing and service of Saskatoon's only certified organic urban farm.  
A recent highlight of being involved at Vertfarms is getting invited to speak at this year's Organic Connections Conference and Tradeshow last November.  
<https://www.organicconnections.ca/conference-presenters/presenter/lyman-moreno.html>

### Engineering and Design Lead

Mar 2018 – May 2020

Farm Boys Design Corp, Saskatoon, Saskatchewan, Canada

- Extensively involved in the design, prototyping and testing of various components, processes and parts of a fully automated modular indoor growing system called the Aeropod. This includes monitoring and control systems of both indoor environment and water/nutrient delivery, growing structures, air recirculation, HVAC and electrical requirements, among others.
- Oversaw engineering research projects
  - Managed federally funded projects which further advanced the Aeropod's capabilities by developing in-house control, monitoring and data acquisition systems and then incorporating artificial intelligence (AI) into the newly developed proprietary system.
  - Led the design of new growing structures based on aeroponics technology. This entailed drafting using 3D CAD software and producing prototypes using in-house 3D printers. For prototyping designs with larger volumes and footprint, I managed to forge a collaboration with SaskPolytech CAD/CAM Engineering to utilize their industrial printers.
- Improved fabrication of different components for laboratory experiments using readily available materials
  - Nursery shelf with complete LED lighting fabricated using LED strips and pump and tubing network for nutrient delivery
  - Grow tent modifications to accommodate larger plants

- Photography rig for consistent image capturing of leaves
- Adjustable light reflector curtains using Mylar and roller blinds
- Managed operation and maintenance of HVAC, electrical, water and automation control systems including installation and troubleshooting
- Managed technical personnel including subcontractors
- Wrote technical reports (from proposals to final documentation) on research grants and projects and sought potential collaborative work with different academic and industrial partners
- 3d CAD modeling and drafting of various parts and designs for marketing including floor plans and schematics
- Performed research and canvassing of various parts, materials and equipment

### **Chemical Automation Specialist**

Aug 2017 – Dec 2018

Yxelabs Inc, Saskatoon, Saskatchewan, Canada

- Wrote research and technical reports related to chemical dispensing and automation. Led a federally funded project towards the building of a proprietary remotely controlled automated chemical dispensing equipment.
- Managed operation and maintenance of various automated chemical dosing/dispensing equipment for laundry facilities and commercial swimming pools
  - Programming of commercial laundry machines and chemical dispensing equipment according to type of linen and desired outcomes
  - Assembly of circuit boards and pumps according to needed volume and type of chemical
  - Testing and calibration of chemical dispensing equipment
  - Setup of dispensing equipment for remote access
- Provided professional installation services of equipment along with corresponding programming
- Managed and supervised technical personnel both on site and remotely
- Provided on demand technical support to clients
- Managed inventory of various parts, materials and supplies

### **Graduate Student Researcher (PhD)**

May 2010 – Apr 2018

University of Saskatchewan, Saskatoon, Saskatchewan, Canada

- Conducted research project formulated with the goal of using microbial fuel cells (which operate under anaerobic conditions) for biodegradation of organics in wastewaters using model organic compounds and actual wastewaters, along with performing teaching assistant (TA) duties and academic responsibilities.
- Performed biokinetic modeling of the utilization of different model organic compounds in a microbial fuel cell. Model predictions were achieved with considerable accuracy and new coefficients were established.
- Wrote research proposals, progress reports, technical papers and presentations pertaining to information and results of research project. Please see below selected list of publications.

- Performed laboratory experiments including preparation, operation and troubleshooting of analytical equipment and instruments, procurement of materials, maintenance of microbial culture, collection and analysis of samples
- Assisted junior graduate students in the conduct of their research projects

### **Teaching Assistant**

University of Saskatchewan, Saskatoon, Saskatchewan, Canada      Various terms, 2010-2015

- As a TA, was assigned as instructor, marker and invigilator for the following undergraduate courses
  - GE 111: Engineering Problem Solving
  - CHE 210: Fluid Mechanics I
  - CHE 461: Introduction to Biochemical Engineering
  - CHE 454: Design of Industrial Waste Treatment Systems

### **Research Assistant**

Nov 2009 – May 2010

Prairie Swine Centre Inc, Saskatoon, Saskatchewan, Canada

- Involved in the formulation and implementation of research projects in the Engineering Division of the Centre
- Tasked to carry out research work dealing with the understanding and mitigation of the environmental impact of gas emissions and wastewater produced from swine production operations
- Involved in writing of proposals, technical papers, progress reports and presentations including processing and analysis of experimental data
- Collected, processed and analyzed various types samples such as gas emissions, wastewater and soil samples, and animal inputs as well as environmental parameters such as temperature and humidity
- Supervised technicians in the conduct of experiments

### **Graduate Student Researcher (MSc.)**

Sep 2007 – Dec 2009

University of Saskatchewan, Saskatoon, Saskatchewan, Canada

- Carried out a research project which aimed at the removal of hydrogen sulfide in swine wastewater using chemical additives (semi-passive treatment)
- Wrote proposal, protocols, progress reports, technical papers and presentations throughout the course of the project
- Performed laboratory, semi-pilot and room scale experiments which entailed collection and analysis of various samples including wastewater
- Conducted soil column and consequently field plot experiments to assess potential impact of treatment on soil conditions as swine wastewater is typically applied to crop lands as fertilizer
- Completed the processing and analysis of experimental data as well as writing of scientific reports and presentations. Please see below selected list of publications.

**Researcher**

May 2006 – Aug 2007

International Rice Research Institute, Los Banos, Laguna

- As part of the Water Management Group, I was tasked to setup and conduct field experiments dealing with the use and management of water in rice production, such as the adoption of alternate wetting and drying (AWD)
- Conducted site visits and consultations with research collaborators including farmers
- Prepared and organized samples such as rice panicles, leaves and soil for analytical analysis
- Conducted processing and analysis of experimental data and writing of technical reports
- Supervised technicians in operation of experiments and processing of samples

**Fabrication Supervisor**

Nov 2005 - Apr 2006

Plant Oil Technology Center, VSU, Visca, Baybay, Leyte

- Managed a team and workshop that was dedicated for production of plant oil stoves
- Collaborated with research and design teams to optimize product and production flow
- 2D and 3D drafting using CAD software

**Educational Background**

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**PhD - Chemical Engineering**

Apr 2018

University of Saskatchewan, Saskatoon, Saskatchewan, Canada

**Master of Science - Environmental Engineering**

Dec 2009

University of Saskatchewan, Saskatoon, Saskatchewan, Canada

**Bachelor of Science – Agricultural Engineering**

Apr 2005

Visayas State University – Baybay, Leyte, Philippines

**Selected Awards/Achievements**

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- Top 20 Finalist (Vertfarms) – 2021 SREDA Go Money Entrepreneurship Competition
- 1<sup>st</sup> Place – Graduate Student Research Competition, 2009 Banff Pork Seminar, Banff, Alberta
- MITACS Internship recipient - May 2009
- 2<sup>nd</sup> Place – Graduate Student Research Competition, 2015 College of Engineering Research Day, University of Saskatchewan
- 7<sup>th</sup> Place – 2007 Philippine licensure exam for professional agricultural engineers

## **Selected Publications**

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Moreno, L., Nemati, M., Predicala, B. (2018) Biodegradation of phenol in batch and continuous flow microbial fuel cells with rod and granular graphite electrodes. *Environmental Technology*. 39(2): 144–156. Available online at: <http://dx.doi.org/10.1080/09593330.2017.1296895>

Moreno, L.D., Nemati M. and Predicala, B. (2015). Biokinetic Evaluation of Fatty Acids Degradation in Microbial Fuel Cell Type Bioreactors. *Bioprocess and Biosystems Engineering* 38:25-38. Available online at: <http://dx.doi.org/10.1007/s00449-014-1240-3>

Moreno, L., Nemati, M. and Predicala, B. (2015). Treatment of Phenolic Wastewaters in Microbial Fuel Cell Using Freely Suspended and Immobilized Cells. CSBE-SCGAB Technical Conference and AGM, Edmonton, AB, Canada, July 5-8. Available online at: <https://library.csbe-scgab.ca/docs/meetings/2015/CSBE15050.pdf>

Moreno, L.D., Predicala, B. and Nemati, M. (2010). Laboratory, semi-pilot and room scale study of nitrite and molybdate mediated control of H<sub>2</sub>S emission from swine manure. *Bioresource Technology* 101:2141-2151. Available online at: <http://dx.doi.org/10.1016/j.biortech.2009.11.011>

Torres-Tello, J., Venkatachalam, S., Moreno, L. and Ko, S.B. (2020). Ensemble Learning for Improving Generalization in Aeroponics Yield Prediction. *IEEE International Symposium on Circuits and Systems*, Seville Spain, October 12-14. Available online at: <https://doi.org/10.1109/ISCAS45731.2020.9181283>

Predicala, B., Alvarado, A., Brown, J., Beaulieu, D. and Moreno, L. (2015). Investigating Environmental Temperature Preference of Group-Housed Sows Fed High-Fibre Diets. CSBE-SCGAB Technical Conference and AGM, Edmonton, AB, Canada, July 5-8. Available online at: <https://library.csbe-scgab.ca/docs/meetings/2015/CSBE15051.pdf>

Predicala, B., Alvarado, A., Brown, J., Beaulieu, D. and Moreno, L. (2015). Determination of temperature requirements of group-housed sows fed high fiber diets to reduce energy costs. *ASABE Annual International Meeting*. Edmonton, Canada. July 5-8. Available online at: <https://elibrary.asabe.org/abstract.asp?aid=45992>

## **Conference Presentations**

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Moreno, L., Nemati, M. and Predicala, B. (2015). Treatment of Phenolic Wastewaters in Microbial Fuel Cell Using Freely Suspended and Immobilized Cells. CSBE-SCGAB Technical Conference and AGM, Edmonton, Canada, July 5-8

Moreno, L., Nemati, M. and Predicala, B. (2012). Application of microbial fuel cell technology in treatment of wastewaters and generation of energy, 62nd Canadian Chemical Engineering Conference, Vancouver, Canada, October 14-17

Moreno, L., Nemati, M. and Predicala, B. (2012). Treatment of model organic compounds in microbial fuel cell type bioreactors, ICEPR 12, 2nd International Conference on Environmental Pollution and Remediation, Montreal, Canada, August 28-30

Moreno, L., Nemati, M. and Predicala, B. (2012). Microbial Fuel Cells: Innovation for Sustainable Energy and Waste Treatment, EnerCan West, Energy and Environment, Regina, Canada, February 13-14.

Moreno, L., Nemati, M. and Predicala, B. (2011). Application of microbial fuel cells in treatment of waters contaminated by short chain fatty acids, Western Canada Water Conference and Exhibition, Saskatoon, Canada, September, 20-23

Moreno, M., Nemati, M. and Predicala, B. (2011). Microbial fuel cells in treatment of contaminated waters, World Water Day- Student and Young Professional Workshop (Canadian Water Research Association and UofS), Saskatoon, Canada, March 22

Moreno, L., Loden, B., Nemati, M. and Predicala, B. (2010). Treatment of organic wastewaters using microbial fuel cell technology, 60th Canadian Chemical Engineering Conference, Saskatoon, Canada, October 24-27

Moreno, L., Predicala, B. and Nemati, M. (2009). Control of hydrogen sulphide (H<sub>2</sub>S) emissions from swine barns using nitrite and molybdate: Effect of Manure Age.(First Prize Winner), Banff Pork Seminar, Banff, Canada, January 20-23

Moreno, L., Predicala, B. and Nemati, M. (2008). Control of H<sub>2</sub>S emissions from swine barns and livestock operations using a biological approach, 58th Canadian Chemical Engineering Conference, Ottawa, Canada, October 19-22

## References

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### **Daniel Robinson**

Co-founder

Farm Boys Design Corp and Yxelabs Inc

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