NABIL RAMLAWI

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EDUCATION

University of Illinois Urbana-Champaign (UIUC) — Illinois, USA
Ph.D. Mechanical Engineering (Advisor: Randy Ewoldt) — *Dec 2023*
Research focus: Rheology
M.S., Mechanical Engineering — *Dec 2018*

American University of Beirut (AUB) — Beirut, Lebanon
B.E. Mechanical Engineering — *June 2016*
Minor in Mathematics

TECHNICAL SKILLS

Material Characterization	Rheometry (ARES-G2, DHR, MCR), DMA, and DSC.
Simulations	Molecular dynamics, Computational Fluid Dynamics
Programming	Proficient in Python and Matlab.
Data Analysis	Machine learning, Bayesian inference, optimization, and model fitting.

RESEARCH EXPERIENCE

Ewoldt Research Group, UIUC — Illinois, USA
Postdoctoral Research Associate — *Nov 2023 -Present*

- Investigating the relationship between the rheology and the texture properties of real and imitation meat products.
- Providing scientific support to industrial partners in formulating and patenting novel plant-based seafood alternatives using thorough rheological characterization.

Graduate Research Assistant — *Jan 2019-Oct 2023*

- Developed new rheological characterization tools and protocols that reveal more information about the performance and fundamental physics of complex materials to build better structure/property relationships.
- Conducted rheology, DMA, and DSC experiments on various polymer networks to develop a physical understanding and support the formulation of novel thermoplastics and recyclable thermosets.
- Automated the analysis of large rheological datasets to reduce complex data into meaningful metrics.
- Collaborated with multiple research groups on campus and internationally, spanning the fields of chemistry, physics, materials science, and food science.
- Maintained lab rheometers and trained group members to use the instruments.

Motif Foodworks — Boston MA, USA
R&D Intern — *June -August 2022*

- Developed a standard operating protocol to test the nonlinear rheology of sustainable plant-based foods.
- Discovered rheological fingerprints of stretchy cheese (structure-property-performance relationship) through testing more than 15 commercial dairy cheeses.
- Collaborated with colleagues from various teams on the design of rheological experiments for product exploration and development.

Computational Multiscale Nanosystems, Beckman Institute, UIUC — Illinois, USA
Graduate Research Assistant — *Aug 2016- Jan 2019*

- Developed a novel, fast, and accurate coarse-grained **molecular dynamics** transport model for confined water in nanochannels that can capture both structure and dynamics of confined water.

SELECTED PUBLICATIONS

1. **N. Ramlawi**, M. T. Hossain, A. Shetty, and R. H. Ewoldt, Stress-controlled medium-amplitude oscillatory shear (MAOStress) of PVA-Borax, *Arxiv* (2024).

2. **N. Ramlawi**, L. Piñeiro-Lago, et al., Large amplitude oscillatory shear stress (LAOStress) analysis for an acid-curd Spanish cheese: Afuega'l Pitu *atroncau blancu* and *roxu* (PDO), Food Hydrocolloids, 108720 (2023).

3. **N. Ramlawi**, N. A. Bharadwaj, and R. H. Ewoldt, Medium-amplitude oscillatory shear (MAOS) predictions for the Johnson-Segalman/Gordon-Schowalter non-affine deformation model, Journal of Rheology, 64(6), 1409-1424 (2020)

4. L. Porath, **N. Ramlawi**, et al., Molecular design rules for imparting multiple damping modes in dynamic covalent polymer networks, Chem. Mater., 36, 4, 1966–1974 (2024)

5. J. Huang, **N. Ramlawi** et al., Dynamic Covalent Bond Exchange Enhances Penetrant Diffusion in Dense Vitrimers, Macromolecules 56 (3), 1253-1262 (2023)

6. J.C. Cooper, **N. Ramlawi** et al., Innate Reprocessability in Engineering Thermosets, *ChemRxiv* (2024).

7. L. Porath, J. Huang, **N. Ramlawi**, et al., Relaxation of vitrimers with kinetically distinct mixed dynamic bonds, Macromolecules 55 (11), 4450-4458 (2022)

8. J. Feng, **N. Ramlawi**, et al., Internally mixed nanoparticles from oscillatory spark ablation between electrodes of different materials, Aerosol Science and Technology, 52(5), pp.505-514 (2018)

CONFERENCE PRESENTATIONS

1.	"Comparing Pipkin maps from stress and strain medium amplitude oscillatory shear"	SOR 2022
2.	"Pseudo-linear large amplitude oscillatory shear stress"	SOR 2021
3.	"Non-affine velocity fields to explain weakly-nonlinear rheology"	APS 2020
4.	"Medium-amplitude oscillatory shear predictions for the JS/GS non-affine model"	SOR 2019
5.	"Coarse-grained transport model for nano-fluidic systems"	APS 2018

TEACHING EXPERIENCE

Ewoldt Research Group: Undergraduate Research Mentor   *June-August 2020*
- Supervised and mentored an undergraduate student on a research project related to using machine learning for rheological inference.

UIUC Mechanical Science and Engineering: Instructor   *June-August 2020*
Introductory Fluid Mechanics
- Planned and lectured the course, held office hours, and assigned homework and exams.

UIUC Mechanical Science and Engineering: Teaching Assistant
Non-Newtonian Fluid Mechanics and Rheology   *Jan-May 2020*
- Co-authored lab reports and designed the first lab sessions of the rheology course. Assisted and guided undergraduate and graduate students through rheology experiments and projects.

AWARDS AND HONORS

1. **Mavis Future Faculty Fellow**: College of Engineering fellowship to train next-generation faculty.

2. **MechSE Teaching Fellow**: Departmental opportunity for exceptional students to instruct a full course.

3. **Best paper award**: The 13th FEA Student and Alumni Conference- American University of Beirut.