



Research & Grants Expo

2021

Session 11:00-11:30



Researcher(s)

Lattice Spring Model of Mechanics – Gavin Buxton – SEMS

RMU Astromech Project – Benjamin Campbell – SEMS

One Knee Does Not Equal Two Gloves: The Flaws in Equating Colin Kaepernick to Tommie Smith and John Carlos – Anthony Moretti – SIHSS

The Non-liability of “Foreignness”: Theorizing the Habitus of Immigrant Entrepreneurs in the Practice of Bricolage – Eliada Griffin-EL – SBUS

Lattice Spring Model of Mechanics

Gavin Buxton

Department of Science, Robert Morris University.



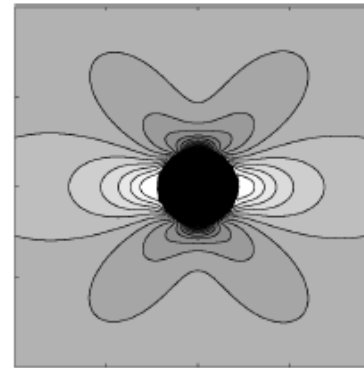
Introduction

The Lattice Spring Model (LSM) is a continuum elastic model of mechanics and fracture. Here a random lattice structure of springs is mapped on to continuum elasticity. The iterative removal of the springs can constitute crack propagation. For the first time a random distribution of springs is shown to recover linear elasticity through the choice of individual spring stiffness's

Methods

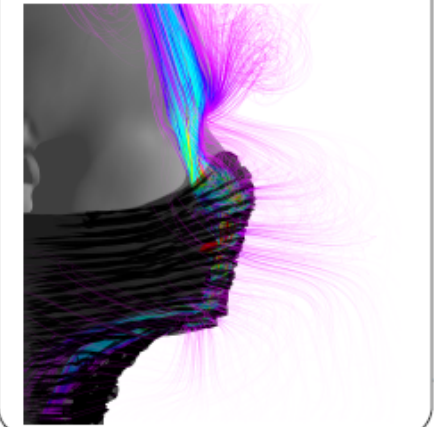
The energy associated with the system of springs is compared to continuum elasticity theory, and the stiffness's of the spring varied to match the two. This is an optimization problem. Once the stiffness's of the springs are determined the springs can locally be made stiffer to simulation the strain field around an inclusion (right) or springs can be removed to capture crack propagation (below).

Elasticity

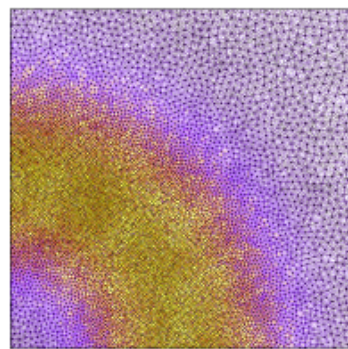
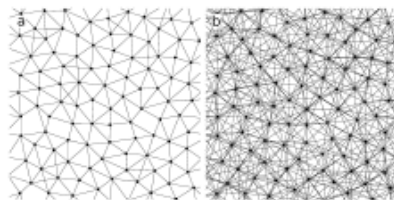
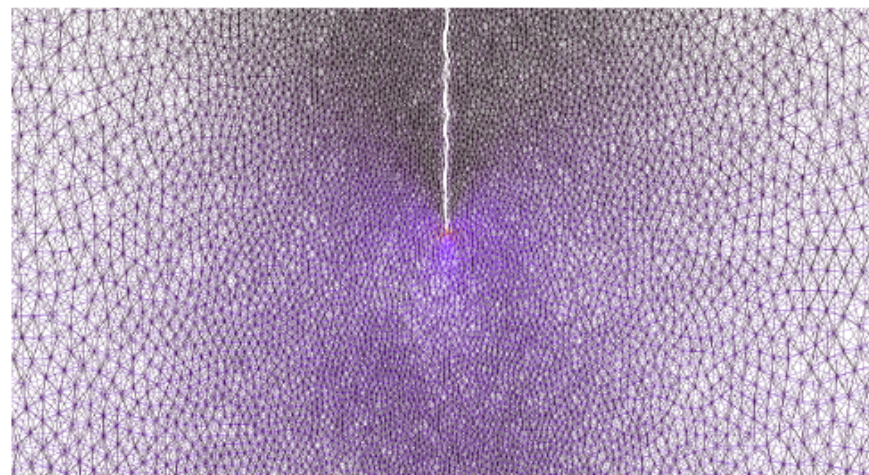


Conclusions

The computer code that has been coded (but not the math) is two-dimensional at present, although as shown below a two-dimensional surface can deform in three-dimensions, and I'm looking for new applications.



Fracture Mechanics



Bibliography

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RMU Astromech Project

Ben Campbell



ENGINEERING STUDENT
RESEARCH CLUB

School of Engineering, Mathematics and Science
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Introduction

The RMU Mechatronics Club, Engineering Student Research Club and Association of Computing Machinery Club have combined their resources to work on a joint project to create a life-sized and functional Astromech robot (for legal reasons we unfortunately can't call it RMU2-D2). This robot will be a multi-year ongoing learning project with upgrades and add-ons to expand functionality. The students are using the online resources of the R2-D2 Builders Club to guide their work.

The Goal: An Astromech Robot



Methods

The project has been split in to four work groups: Mechanical, Manufacturing, Software/Electrical and Aesthetics. Each has 1-2 team leads and 4 or more members.

Mechanical Team:

Responsible for all design aspects of the robot, preparing CAD drawings and components lists.



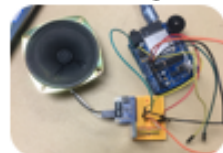
Manufacturing Team:

Responsible for 3D printing, milling, lathing casting and assembling parts.



Software/Electrical Team:

Responsible for the electrical design and software controls for electro-mechanical systems.



Methods (cont.)

Aesthetics Team:

responsible for cleaning, painting, polishing, and all visual aspects of the robot.



Results (to date)



Conclusions

The robot's dome is on track to be mainly complete near the end of the Spring 2021 semester. The students will then shift focus to the legs and drivetrain so the robot can stand and maneuver. Once fully assembled, students will experiment with sensors and autonomous navigation. When finished, this robot can be taken by RMU students to local schools for outreach or Children's hospitals to visit patients. This Robot has been registered with Disney to coordinate volunteers to local official Star Wars events. There are also plans to build an RMU themed covering for the robot so it can be taken to official RMU events without risking copyright infringement.

Acknowledgments

Thanks to our sponsors: SGA, Office of Student Life, and the RMU Shark Tank Competition. Also thanks to Lab Engineer Gabe Cottrell for fabrication support. Many thanks to the RMU legal team for guidance on how to proceed without infringing on Disney's intellectual property. Student Team Leaders: Xiara Long, Cora Danner, Billy Clegg, Jamie Keller, Ryley Danielson, and Patyn Szymkiewicz.

One Knee Does Not Equal Two Gloves: The Flaws in Equating Colin Kaepernick to Tommie Smith and John Carlos

Dr. Anthony Moretti

Associate Professor, Dept. of Communication and Organizational Leadership,
Robert Morris University



Introduction

In 2016, Colin Kaepernick's decision to begin kneeling during the national anthem to protest police brutality drew attention to another protest, one made by sprinters Tommie Smith and John Carlos at the 1968 Mexico City Olympics. This research suggests those comparisons are flawed, though Kaepernick's decision ought not be considered more or less appropriate than Smith's and Carlos' raised fist covered in a black glove.

The Argument's Flaws: Upbringing, Individual vs Group Action, and Media Response

1. Kaepernick enjoyed a more stable upbringing; he was the adopted son of a white, middle-class family, while Smith and Carlos came from poor black families.
2. The actions taken by Kaepernick in 2016 aren't comparable to what Smith and Carlos did in 1968; the former was not part of any group that had planned protest activities.
3. Media reaction in 2016 differed sharply from 1968; Kaepernick had widespread support among the media community; Smith and Carlos did not.

The Iconic Photos



[Photos: TOP: nydailynews.com; BOTTOM: nytimes.com]

The argument

In the minds of many journalists, Colin Kaepernick was akin to Tommie Smith's and John Carlos' heir because he protested the national anthem as a means to call attention to social inequality. Much like Smith and Carlos, who lost millions of dollars in potential income because of their actions, Kaepernick suffered for his decision because he was cut by his NFL team in 2016 and has remained out of football since.

Key Quotes



KAEFERNICK: Whenever he would be with his adopted family on vacation, "somebody would walk up to me, a real nervous [metal] manager, and say, 'Excuse me, is there something I can help you with?'"



CARLOS: He suffered from dyslexia, and he says one of his teachers didn't care. That teacher "literally made me wear a dunce cap in the corner."



SMITH: In assessing the response by the American public and media, after he and Carlos returned to the U.S. from Mexico City: "You'd think I committed murder."



Washington Post reporter **KEVIN BLACKSTONE:** All three athletes "dared to protest in the athletic arena, where we wrap events in a prophylactic of patriotism used to demand conformity and suppress discourse."

Conclusions

1. Athletes today are on firmer financial footing as they undertake social/political protest.
2. Perhaps Kaepernick is aligned more with civil rights than social justice.
3. Regardless of the label assigned to them, all three men fought the good and right fight.
4. Kaepernick has largely ignored the media spotlight; Smith and Carlos were never given one.



The Non-liability of "Foreignness": Theorizing the Habitus of Immigrant Entrepreneurs in the Practice of Bricolage



Eliada Griffin-EL, PhD., Robert Morris University
 Joy Olabisi, PhD., Rochester Institute for Technology

Introduction

Between 2008-2017, African foreign nationals periodically experienced xenophobic violence in some of South Africa's economically disadvantaged communities. We sought to examine, "How do immigrant entrepreneurs access resources when in an environment that is adversarial to foreign nationals?"



"Hundreds of people march against the anti-immigrant violence in Durban." (BBC, 2015)

Methods

RESEARCH APPROACH:

Longitudinal multiple case study

- Data Type: Triangulation of observations, documents, and semi-structured with 8 immigrant entrepreneurs

- Data Collection: Round 1 - 2013, Round 2 - 2015

- Data Source: Purposive sample via networks and referrals.

RESEARCH ANALYSIS:

Grounded Theory

- Thematic code generation of qualitative data.

- Investigation of themes, patterns, and relationships within each case and comparatively across

- Development of theoretically-driven propositions

"Business is also knowing how to actually maneuver around, having the right people, having the right connections."

~Founder (Malawi), "Lilongwe Media"

Proposition #2

Immigrant entrepreneurs generate local social capital to enable access to local resources, which were deemed inaccessible due to their foreign status, in order to create new/non-traditional uses of these resources.

"It's the Namibian way. We're not born to work for someone else." ~ Founder, Club Lights Out

"It takes longer for me as a refugee to start and raise an enterprise because I am a registered refugee."

Founder, Deaf Awareness (Zimbabwe)

Proposition #1

The immigrant entrepreneur's habitus (IEH), utilizes an *adaptive disposition* (to apply resilient) & *cognitive disposition* (to use cultural knowledge frameworks) in constructing novel resources in an adversarial host country's social structure.

Proposition #3

The immigrant entrepreneur's perceived liability of foreignness creates an adversarial social field that discriminates against foreigners, and increases the propensity for immigrant entrepreneurs to engage in bricolage activity.

Discussion & Conclusions

(Habitus of the immigrant entrepreneur) (Local Social Capital) + Liability of foreignness = Bricolage (Non-Traditional Resource Mobilization)



Implications

Habitus of immigrant entrepreneurs suggests that 'foreignness' is not always a liability, but also critical in interpreting novel uses of existing resources. This contributes to timely discourse about economic inclusion and recognizing diverse approaches within a nation's entrepreneurial community.

Theoretical Concepts

Liability of Foreignness:

The cost which a firm incurs when doing business in another country, which local firms do not incur. (Zahra, 1995)

Entrepreneurial Bricolage:

The process of resource construction for a venture-building process (Baker & Nelson, 2005)

Theory of Practice (Bourdieu, 1977, 1984)

