

**Fall 2021**

**Undergraduate  
Research  
Symposium**



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**from Nov 6 to 15**

**NYU**  
**上海**



**SHANGHAI**  
**纽约大学**

# ABOUT

The NYU Shanghai Undergraduate Research Symposium is a university-wide celebration of research which showcases work from undergraduates spanning the Arts and Sciences, Engineering and Computer Science, and Business. The Symposium features recently completed projects by Major Honors students, as well as research papers and creative work by students for their Capstone Projects, Independent Study Courses and as part of the Dean's Undergraduate Research Fund (DURF).

Visitors will have the opportunity to cast a vote for the project that most impresses them, and a panel of NYU Shanghai faculty will select the winning projects.

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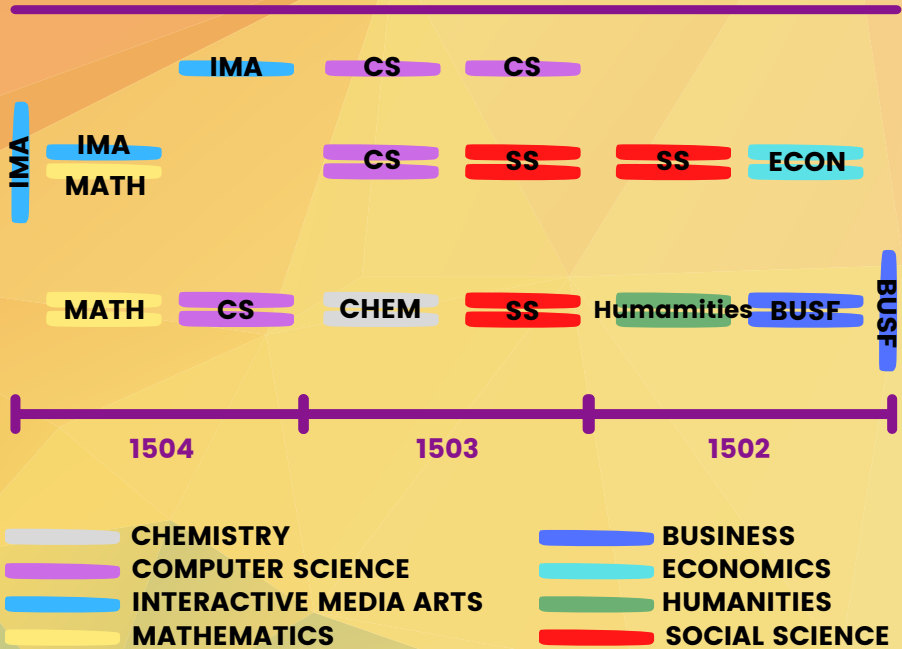
## **Liberal Arts & Business**

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## **STEM & Media**

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# Floor Plan



## 9:00–10:05 AM Liberal Arts & Business Presentations in Room 1502

- Business
- Economics
- Humanities
- Social Science

## 9:00–10:10 AM STEM & Media Presentations in Room 1504

- Chemistry
- Computer Science
- Interactive Media Arts
- Math

## 10:10–11:30 AM Q&A



# Liberal Arts & Business

**BUSINESS  
ECONOMICS  
HUMANITIES  
SOCIAL SCIENCE**

# **Innovative Risk and Return Measurement Model in FinTech Companies**

**Chen, Zhu**  
**Yang, Wanyi**  
**Li, Xinyu**

**AREA: Business**  
**MENTOR: Liao, Ming**

With the development and wide-range applications of big data technology, the exploitation of value behind massive data becomes a heated topic in various scenarios. By utilizing data gleaned from tech-oriented companies in FinTech industries, our project aims to build an innovative, accurate model to measure the investment risk and return of these companies. Overall, we'd like to measure the importance and impact of patents, as a leading indicator of technology strength and business performance. We expect our model can be applied in venture capital investment and some other evaluation scenarios in the FinTech industry.

# **Never Eat Alone? Inspirations for the Catering Industry from the Development of One-Person Meal Market in China**

**Xie, Xintong**  
**Men, Qiutong**

**AREA: Business**  
**MENTOR: Zhang, Jiding**

"With the rapid growth of the single economy, "Eating alone" is seen by more young singles as a reflection of their independence and freedom. "One-person" restaurant offers a wide variety of dishes and affordable prices to satisfy customers' taste buds and wallets. This paper will start from the definition and origin of "One-person" restaurants, analyze the customer portraits, and also the 4Ps through the data collecting from Shanghai. It will also analyze the industry development prospect and trend. Finally, it will provide insights and advice for future businessmen who are ready to join the "One-person" market.

# **The Prospect of Airbnb in the Chinese Market in the Post-Pandemic Era**

**Zhang, Yimeng**

**AREA: Business**

**Xu, Hanting**

**MENTOR: Weng, Weiwei**

Over the years, Airbnb China learned to operate successfully in the Chinese marketplace and, before the COVID-19 pandemic hit, ranked first for perceived brand quality and reputation in China in 2019. However, COVID-19 significantly disrupted the business of Airbnb China and curtailed its ambitious development objectives. The unprecedented global travel restrictions and stay-at-home orders caused by COVID-19 resulted in a super-shock to peer-to-peer accommodation network facilitators. We tried to use data visualization, sector comparisons, and due diligence to figure out the key problems such as the loss of hostesses and less popularity in the second-tier cities.

# Happy Spouse, Happy House: Collaborative Risk-Taking and Marital Satisfaction

**Chen, Yumeng**

**AREA: Economics**

**MENTOR: Set, Eric Brendan**

In this study we explore the links between marital satisfaction and how married couple's approach decision-making under risk. We gave out online surveys and conducted online experiments with married couples through WeChat video-chat. Couples first made some economic decisions apart, then brought together to make choices. Half of the couples were informed their partner's choices before they decided together; the other half were not informed. We are interested in whether marital satisfaction correlates to the aspects of individuals' preferences (e.g., the difference between husband and wife) and how couples make choices (e.g., if one member dominates), and whether awareness of one's partner's preferences influence the decision-making process and outcomes.

# Remote Working and Labor Market Matching

## Efficiency

**Xu, Yihan**

**AREA: Economics**

**Xu, Jingzhi**

**MENTOR: Xu, Nan**

During the COVID-19 pandemic, remote working has provided many firms and employers with a new mode of working. In this research, we aim to study the effects of remote working on labor market matching efficiency. We hypothesize that there is a positive effect on efficiency because remote working largely reduces the limitation of the distance between work and home, enlarging the job opportunities for job applicants and choices of employees for firms. This research will contribute to the traditional matching theory and provide insights for increasing matching efficiency in the real world.

# **Censorship in Capitalist and Communist Countries**

**Liu, Yiran**

**AREA: Humanities**

**Yan, Kehui**

**MENTOR: Schechter, Brandon**

This study aims to compare and contrast censorship in capitalist and communist countries. This research will first provide an overview of how past authors' insights on human nature influence the pursuit of communist or capitalist social organization. Then, we propose to analyze censorship in two countries which typically represent capitalism and communism, the US and Soviet Union. We will focus on television and news publications to examine the implementation of censorship, elucidating that censorship exists in both capitalist and communist countries, but in different forms.

# **The Struggle between Daily Life and Religious Practice: How Muslim Women Are Influenced by Chinese Society**

**Yan, Yining**

**AREA: Humanities**

**MENTOR: Wen, Shuang**

Muslims living in Hohhot have a comparatively short history. But they still developed the community based on the local environment. In modern times, Muslim women living in Hohhot have their own struggle between religious practices and daily life. By conducting oral history interviews with local Muslims, I intend to find out what is their struggle and why the struggle existed. As a result, education is an important factor leading the change in various aspects, which also result in bigger influence the Chinese society has on Muslim women in Hohhot, though Muslim women tried to preserve the Islamic tradition.



# **Datong City Wall: Cultural Value, Social Impacts and Reflections on Cultural Heritage Reconstructions in Urban China**

**Chen, Cissy**  
**Li, Eric**  
**Li, Karen**  
**Zhang, Pika**

**AREA: Social Science**

**MENTOR: Zuo, Lala**

The reconstruction of Datong ancient city wall is a unique case in cultural heritage preservation in urban China. Years went by and the appearance of the city changed dramatically, yet the controversy still goes on. This research project explores the cultural value of the reconstructed Datong city wall and analyzes its social impacts, with a view to deriving implications for cultural heritage reconstruction in China. By comparing historic documentations and the reconstruction plan, doing surveys and interviews, and conducting data analysis, this study examines the necessity of the Datong city wall reconstruction project and provides generalized, cross-disciplinary insight for future practice.

# **How Does Sexual Dysfunction Relate to Relationship and Sexual Satisfaction among Chinese Adults?**

**Huang, Sijia (Leslie)**    **AREA: Social Science**  
**MENTOR: Santtila, Pekka**

This study aims to investigate how sexual dysfunction affects relationship satisfaction and sexual satisfaction for Chinese adults who are currently in a relationship. We found that for both men and women, the happier they are with their relationship, the more satisfied they are with their sex life and the fewer sexual dysfunctions they have, and vice versa. Also, the longer the relationship is, the fewer sexual dysfunctions one has. For men, ejaculation problems are associated with erectile dysfunction. Those findings suggest that sexual dysfunction does cause dissatisfaction in people's sex life and longer relationship is likely to lead to less performance anxiety.

# **Are College Students with Higher Gender Role Conflict Levels in China at Higher Risks of Depression, but Still Hold More Negative Attitudes towards Counseling?**

**Lin, Brandon**

**AREA: Social Science**

**MENTOR: Santtila, Pekka**

Gender roles are present in all cultures around the world. However, individuals may not all conform to these roles, this causes gender role conflict. Previous research has indicated that American men with higher gender role conflict levels face double jeopardy, where they experience depression in more severity and are also more reluctant to engage in help seeking behavior. This study aims to examine this problem in the Chinese context.

# **Effects of a Brief Mindfulness Intervention on Emotionality during Dream Content and Daytime Events**

**Lu, Annie**

**AREA: Social Science**

**MENTOR: Blum, Daniel Jin**

While dreams are not what actually happens in reality, the contents bring emotions just like we experience them in real life. Dream emotions and daytime emotions may correlate to each other and influence each other. Mindfulness is considered an intervention that may affect daily experiences and may help improve emotional performance in dreams and real life. However, doing mindfulness at night may have a different level of impact on emotional stability compared to doing it in the morning, which will be examined in the study.

# **Confidence in the State [Guojia] Speaks: Narratives on How Vendors Evicted from Their Wet Market Re-produce Their Space in Shanghai**

**Shi, Jiannan**

**AREA: Social Science**

**MENTOR: Li, Yifei**

The capital-driven urbanization and government-led urban regeneration projects are transforming the wet markets into vegetable markets in post-reform China, sometimes neglecting the situations that the vendors in wet markets would face after that transformation. This paper draws evidence from a two-month ethnography around the transforming Yuyuan Market in Shanghai, and presents the vendors' narratives on their responses to it: relocations and emotional coping. Their narratives reflected the power dynamics among vendors' perceptions of urban regeneration policy, hukou status, and different levels of confidence on an ambiguously defined concept "guojia [the state]." These factors made up the perplexity of how the vendors re-produce their space after their eviction from the original market.

# Shanghai Urban Polycentric Development: A Case Study from 2008-2021

**Yang, Ziyang**  
**Huang, Linzjie**

**AREA: Social Science**  
**MENTOR: Guan, Chenghe**

Shanghai Municipal Bureau of Planning and Natural Resources announce a major development plan for building 5 new towns in Jiading, Qingpu, Songjiang, Fengxian, and Nanhui and make them become “Independent comprehensive pivotal cities in the Yangtze River Delta urban cluster” (2017). However, whether Shanghai has developed to be a functionally and morphologically polycentric city in terms of density, vitality, and inter-center connection under the “five new town policy” is still to be studied. This study uses multiple open-source data including housing price data and point of interest (POI) data to measure the urban vitality, transportation accessibility, industrial, commercial, and residential housing development of these five new towns.

# **STEM & Media**

**CHEMISTRY**

**COMPUTER SCIENCE**

**INTERACTIVE MEDIA ARTS**

**MATHEMATICS**

# **Exploration of the Ability for Common Chinese House-Hood Plants to Absorb Formaldehyde**

**Chen, James**  
**Yang, Shanglin**  
**Fu, Jingyao**

**AREA: Chemistry**  
**MENTOR: Sun, Xiang**

In this experiment, we aim to test the ability of different kinds of common Chinese house-hood plants to absorb formaldehyde with different methods. The basic method is to create a small-sealed space to generate a relatively stable atmosphere and test the change of the concentration after each plant is placed; the difference of the formaldehyde concentration represents the ability for absorbance. After the experiment, it was found that monstera deliciosa has the strongest ability to adsorb formaldehyde. However, its ability was still too weak to absorb the for a house. The best way to remove it is through ventilation.



# Clustering Molecular Structures for Next-Generation Solar Cell Material Discovery

**Li, Gustave**

**AREA: Chemistry**

**MENTOR: Sun, Xiang**

The Carotenoid-Porphyrin-C60 triad molecule is a promising material in organic solar cells. It is reported that the triad conformation largely affects its charge separation process. In this project, we aim to explore machine learning pipelines that cluster thousands of triad molecules. We finally picked three machine learning pipelines that are more suitable for triad clustering: PCA reduced xyz data clustered by KMedoids for 6 clusters with RMSD threshold = 0.36; PCA reduced xyz data clustered by GMM for 7 clusters with RMSD threshold = 0.36; kPCA reduced xyz data clustered by KMeans for 6 clusters with RMSD threshold = 0.36.

# Blockchain Technology Popularization

**Chen, Panyu**

**AREA: Computer Science**

**Chen, Sheldon**

**MENTOR: Marin, Olivier-Gilles**

Popularizing blockchains has gained importance as cryptocurrencies capture the masses' attention. Yet present pedagogical methods are either too abstruse for the public or distorting reality while simplifying it. So here we create two backstories and continually add metaphors for different blockchain elements into the narrative to reach a balance of simplicity and richness in content. And after proposing an exercise that test one's understanding and an evaluation rubric, we apply the evaluation to our own analogies. Results indicate separated elements in the blockchain are nicely introduced, but additional explanation of the complete working process of the blockchain is still needed.

# **Qilin, a Robot-Assisted Chinese Language Learning**

**Nomoto,  
Momoe  
Lustig, Andrew  
Michael**

**AREA: Computer Science  
MENTOR: Cossovich,  
Rodolfo**

For English speakers, one of the most difficult languages to acquire is Mandarin Chinese, but how about through robot-assisted language learning. In this experiment, we evaluated the effectiveness of virtual and physical learning assistants through levels of engagement and frustration. Half of the subjects were tested with a virtual companion, while the remainder were placed within an “experimental” group, tested with a physical robot. The subjects demoed multiple functions involving Chinese learning, completing a survey detailing their experience following the test’s completion. Subjects in the “experimental” group reported higher feelings of engagement, but both groups reported feelings of discouragement.

# Generalized Sorting with Vertex-Related Cost

**Shao, Yiyang**

**AREA: Computer Science**

**MENTOR: Guo, Siyao**

Based on the fundamental question of sorting in algorithm, generalized sorting is a more practical development, where comparisons have different costs. One intuitive way to build the cost model is to give each vertex a corresponding cost. In this project, we study the generalized sorting problem with vertex-related cost. In this project, we propose a randomized algorithm with an expected cost of  $O(\log n)S$ . Furthermore, we prove that our algorithm reaches the cost with a high probability. Finally, we prove  $O(\log n)S$  to be the lower bound of the problem.

# **A Study on the Fairness of Online Games' Rating**

**Xu, Ella**

**AREA: Computer Science**

**Pang, Hailey**

**MENTOR: Marin, Olivier-Gilles**

Since many MOBA game players complain about the rating systems and suspect their rating system of fairness, this paper intends to investigate the fairness of China's biggest MOBA game, Glory of King. We created two rating algorithms for each with an idea derived from the analytical hierarchy process. We came up with two improved rating algorithm and the original one. We compared those rating results and found significant differences between the expectation of the players and the current rating system.

# Knowledge-Grounded Task-Oriented Dialogue Modeling on Spoken Conversations

**Xu, Jiacheng**

**AREA: Computer Science**

**Liao, Tinglong**

**MENTOR: Tam, Yik-Cheung**

**Wang, Zecheng**

**Zou, Seeger**

**Yuan, Shuhan**

We proposed a system for knowledge-grounded dialogue modeling in spoken language in the Tenth Dialogue System Technology Challenge (DSTC10). Our system introduced a preliminary selection stage to the original pipeline for mitigating the effect of erroneous user utterance. We used token-classification model plus elastic search to extract candidate entities from the dialog, and together with pre-clustered knowledge entries, our model can prune unlikely knowledge candidates. Furthermore, we proposed a model for identifying the error region in the user utterance which can be exploited to make corrections to the user utterance. Our model ranked 8th in the final result.

# Research and Implement of Video Semantic Segmentation, with Possible Improvements

**Xu, Muyang**

**AREA: Computer Science**

**Zhu, Qianyu**

**MENTOR: Guo, Li**

**Zhang, Chengyu**

**Chen, Star**

In computer vision, segmentation refers to detecting and locating different image fragments at the pixel level, with application in both image and video. While the most cutting-edge research has focused on the field of image, our team is aimed at migrating application of related ideas and techniques to the region of video, which shows great potentials for automatic driving, drone monitoring, and other aspects of robot vision. Our research is based on current mainstream algorithms of video semantic segmentation (backbone for feature representation + context modeling for outcome consistency), cross-comparing the validity of various strategies, and applied mIOU as an evaluation index.

## **Four AM**

**Bian, Leah  
Jin, Jyoti**

**AREA: Interactive Media Arts  
MENTOR: Lee, Inmi & Godoy,  
Marcela**

In human perception, four AM often exists in the form of vacancy, swallowed by distorted time and space, twisted between soberness and uncontrol. Yet such perception is not universal. Through capturing and imaging, we hope to go beyond human thinking, re-establish resonance with the environment, and look for where we belong.

Our project turned out to be a multi-media art exhibition composed of four installations. We explored the presence of this specific hour, in human lives, nature, and supernatural events. We held the exhibition in Room 818 during August 13th to 14th, and received more than 40 audiences.



# **Premade Food in China: Study of Present Chinese Food Culture in Media Representations**

**Fan, Jiayin**  
**Yan, Ziqi**

**AREA: Interactive Media Arts**  
**MENTOR: Pan, Weixian**

Food, the daily necessity, is facing reformation under media and technology adaptation. This project focuses on the authenticity of the food culture under mutations. As media is critical in today's information delivery, food representations in media become bridges between different cultures. Premade food became viral after the outbreak of the COVID-19 pandemic. We discuss the sacrifice of cultural authenticity that the shortened processing time has brought. This project takes A Bite of China and catering products as lenses in investigating northwestern Chinese cuisines and presents the observation through a mix-media mode, including a 30-page essay and a 20-minute short documentary.

# Memory Continuum

**Zhou, Jiachen** AREA: Interactive Media Arts  
**Sheng, Tang** MENTOR: Didakis, Stavros

Through the linkage of the real-time sound-generating device and the 3d visual representations, a virtual space for public memory is created, storing communications between people in the form of collapsed entities of impressions. There, we will be able to explore a virtual space filled with labeled memories out of real conversations.

# Estimating the Maximum Railway Boarding Passengers Based on SIR Model and Simulated Annealing Algorithm

**Lu, Yumeng**  
**Zhang, Yuejia**

**AREA: Mathematics**  
**MENTOR: Mertz, Laurent**

Motivated by the drastic net loss of China Railway during the first half of 2020, we want to calculate the maximum number of passengers one railway station can board while minimizing the risk level. This project will explore the theoretical maximum number of passengers at stations in cities with different risk levels mainly based on the SIR model solved by numerical methods and find the optimal value of function representing risk level proposed by us through simulated annealing algorithm. Considering the difference between the outcome and reality, we also proposed several possible ways to modify our function to improve accuracy.

# Post Earning Announcement Drift in China

**Tang, Xiaoyan**

**AREA: Mathematics**

**MENTOR: Zhou, Xin**

This study examines the performance of earnings surprises in the post-earnings-announcement period in the Chinese stock market from 2013 to 2020. We find that a post-earnings announcement drift (PEAD) anomaly exists in China for every quarterly-released earning announcement. Two groups of data models are constructed to rule out all other possible reasons: One is the Standardized Unexpected Earning (SUE). The other one is the analyst forecast to exclude the influence of momentum. There is evidence that PEAD does exist in Chinese stock market and its profitability can be achieved in the short run.

# Finding the Best Heston Model Parameters in Chinese Stock Market

**Wang, Jialin**  
**Zhou, Yuchen**

**AREA: Mathematics**  
**MENTOR: Wu, Wei**

Our research centers around the question whether there is a probability model that can discover certain predictability behind the uncertainty of the stock market. We chose the Heston Model considering its accuracy in face of stochastic volatility. Selecting an option consisting of stocks of different industries, we applied its data of past two years to a simulated annealing code to calibrate corresponding Heston Model parameters, which we later used to predict the option price of the current year. Finally, we compared our predictions with the real price, got a generally consistent result and analyzed some observed errors.

# Judges



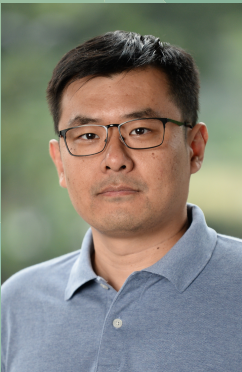
**Elard, Ilaf**

**Assistant Professor of  
Practice in Economics**



**Godoy, Marcela**

**Program Coordinator of IMA  
Assistant Arts Professor of IMA**



**Gu, Xianbin**

**Assistant Professor of  
Practice in Computer Science**

# Judges



**Hooper, Anna**

**Assistant Professor Faculty  
Fellow of Urban Studies**



**Lü, Yiqing**

**Assistant Professor of Finance,  
NYU Shanghai  
Global Network Assistant  
Professor, NYU**



**Marin, Olivier**

**Interim Dean of Arts and  
Sciences  
Professor of Practice in  
Computer Science**

# Judges



**Mertz, Laurent**

**Associate Professor of  
Practice in Mathematics**



**Miao, Jia**

**Assistant Professor of  
Sociology**



# Judges



**Wang, Xingyu**

**Associate Professor of  
Practice in Physics**



**Wen, Shuang**

**Clinical Assistant Professor of  
History**

# Awards

## Most Popular Project

### Liberal Arts & Business:

- Best Presentation
- Best Research Project

### STEM & Media:

- Best Presentation
- Best Research Project



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