

Art Forms: Born Out of Necessity

Urmi Duttagupta

New York City College of Technology of the City University of New York, USA

URMI.DUTTAGUPTA58@citytech.cuny.edu

Abstract: This collection of artworks expresses the artist's profound passion for mathematics and life's complex balance. As a female mathematician, she uses artistic expression and intricate patterns to evoke mathematical beauty and feminine strength, celebrating the presence and resilience of women in mathematics.

My art reflects the social issues that matter to me. My work also frequently celebrates nature and its beauty through vibrant colors. Often, it incorporates geometric patterns and mathematical symbols, signifying my passion for mathematics. As my full-time professorship and motherhood became increasingly demanding, I found it challenging to find time for my hobbies. Feeling unhappy and incomplete, I desperately sought a way to follow my passion. A few years ago, I began doodling with pens and markers to express my thoughts as a distraction—creating repetitive geometric shapes. To my knowledge, I am not aware of anyone who used this technique during that time. Working with markers is mess-free and requires almost no preparation. Thus began my journey with colors, utilizing a drawing pad, pens, markers, and pencils. I started drawing during my daily commute on the bus and subway, at the airport, or on the plane during my conference trips. In other words, emerging from necessity, this technique provided a sustainable way to pursue my dream while bringing a sense of purpose to my life.

I embrace spontaneity and freedom in painting and drawing, rejecting standards and boundaries. Instead of an unembellished representation of nature or contemporary life, depicting subjects as they are, I enjoy capturing moments of life, nature, or social contexts with vibrant colors, breaking down subjects into geometric patterns and shapes, and combining abstract expression with realism. I relish deconstructing an art form into several puzzle pieces, allowing the audience to decide the perfect fit and discover the mystery of the art. All the artwork presented here represents breaking barriers and presenting mathematics, art, music, and other traditional forms unconventionally.

Specifically, the *Woman Balancing Math and Work* was created from a study of a still life. Being forced into isolation and restricted in movement during the COVID-19 pandemic, I sought an escape from the chaos and morbidity. This gave birth to a woman, a mother who finds joy in colors, possesses the most colorful mind, and knows how to balance mathematics and work. This artwork features repetitive patterns of geometric shapes, mainly circles, overlapping each other to highlight the complexities and chaos of a pandemic. Amid all this chaos, she still dreams of a colorful and hopeful world.

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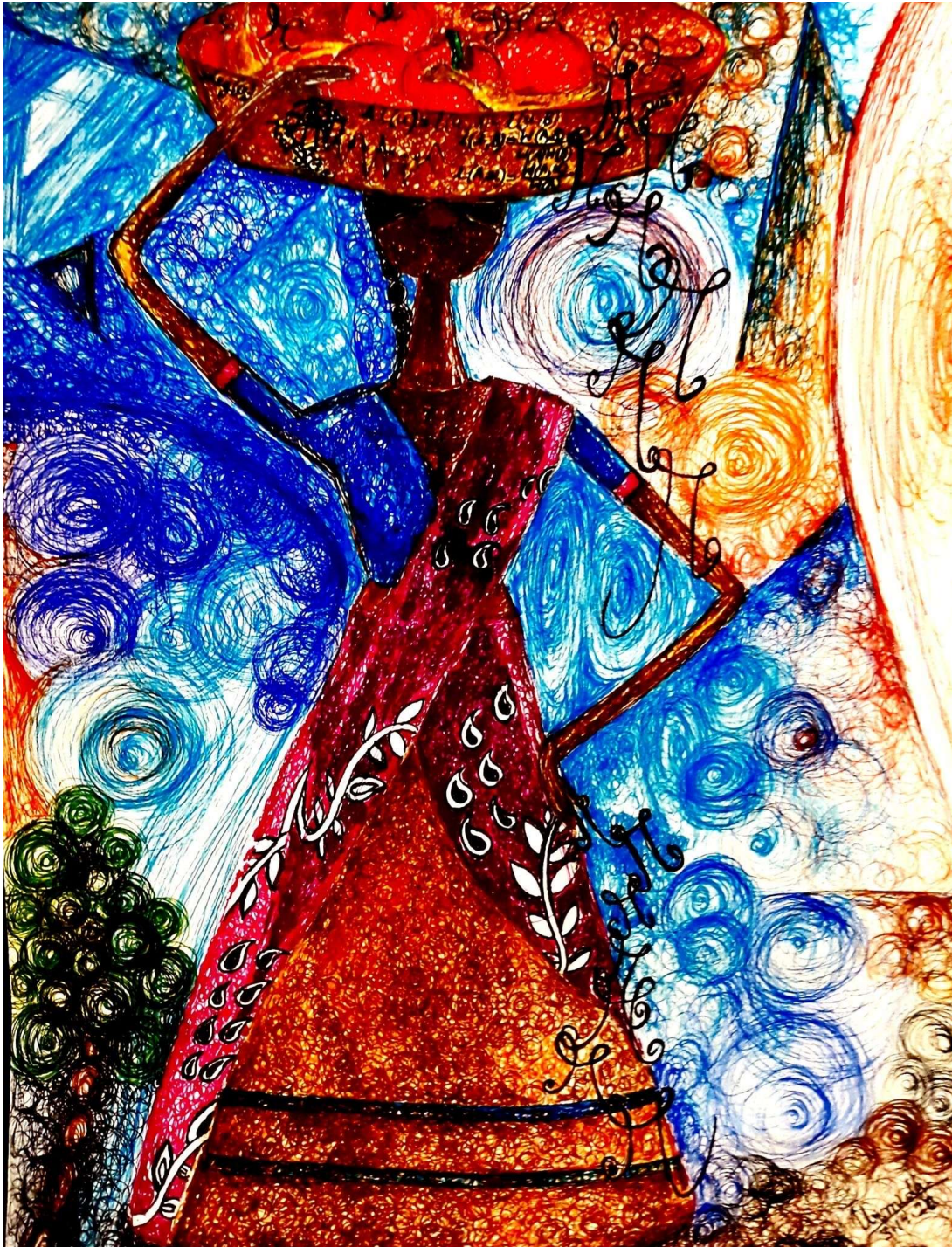


Figure 1: Woman Balancing Math and Work; She Also Has the Most Colorful Mind – pen and marker

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Figure 2: In Love with Mathematics (Black and white) - pen

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Figure 3: Study of Guitar; Quote embedded in the drawing: Where the world fails, music prevails. Original quote by Hans Christian Anderson's: "Where words fail, music speaks." - pencil

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Figure 4: Geometric Turkey – pen and marker

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Figure 5: Me-factor – paper collage



Urmi Duttagupta is the Computer Science Program Coordinator and a Mathematics Department Professor at New York City College of Technology. Her current research interests include infectious disease modeling, applications of graph theory in criminal network analysis, and the development and application of bio-math-related undergraduate modules. She has received many grants including MAA NREUP, a SENCER leadership fellowship, Department of Homeland Security (DHS), and several NSF S-STEM and PSC-CUNY grants. She has mentored more than 45 students in different research projects through the Emerging Scholars program, Honors Scholars program, NYC LSAMP grant, CURM mini-grant, MAA NREUP grant, and DHS grant for undergraduate research.

She is originally from Kolkata (Calcutta), a cosmopolitan city in Eastern India. As an Asian American, she embraces multiculturalism and diversity. She considers herself a lifelong learner and is always eager to learn from her students about their cultures and traditions. Besides solving math problems, she enjoys reading, painting, writing, singing, whimsical dancing, and cooking spicy Indian food.

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