Pascal's Matrix in $\mathbb{Z}_n$

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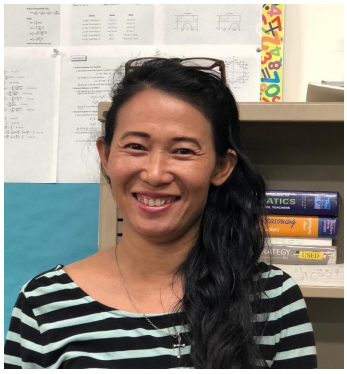
Abstract:

The Pascal's Triangle and binomial coefficients are known to students as early as the high school level. This paper explores several patterns in matrices in $\mathbb{Z}_n$ populated using the rule of Pascal's triangle. We will discuss the patterns in $\mathbb{Z}_p$, $\mathbb{Z}_p^2$ and $\mathbb{Z}_{pq}$ for some prime numbers p and q. Color coding these matrices generates some interesting patterns.



Tuyetdong Phan-Yamada enjoys building interactive graphical illustrations with GeoGebra, which she integrates into her lesson plans for statistics, trigonometry, and calculus courses. She extended her computational activities from the classroom to industry practice as a summer 2014 faculty research fellow at the Jet Propulsion Laboratory in Pasadena, California. She also hosted the Ignite Event at the CMC3-South Spring Annual Conference 2016–2017. She has presented much of her work at conferences and in journals. Artwork from one of her previous articles was featured on the cover of the *MathAMATYC Educator* (September 2014). Some of her other work can be viewed on the website, phan-yamada.weebly.com.