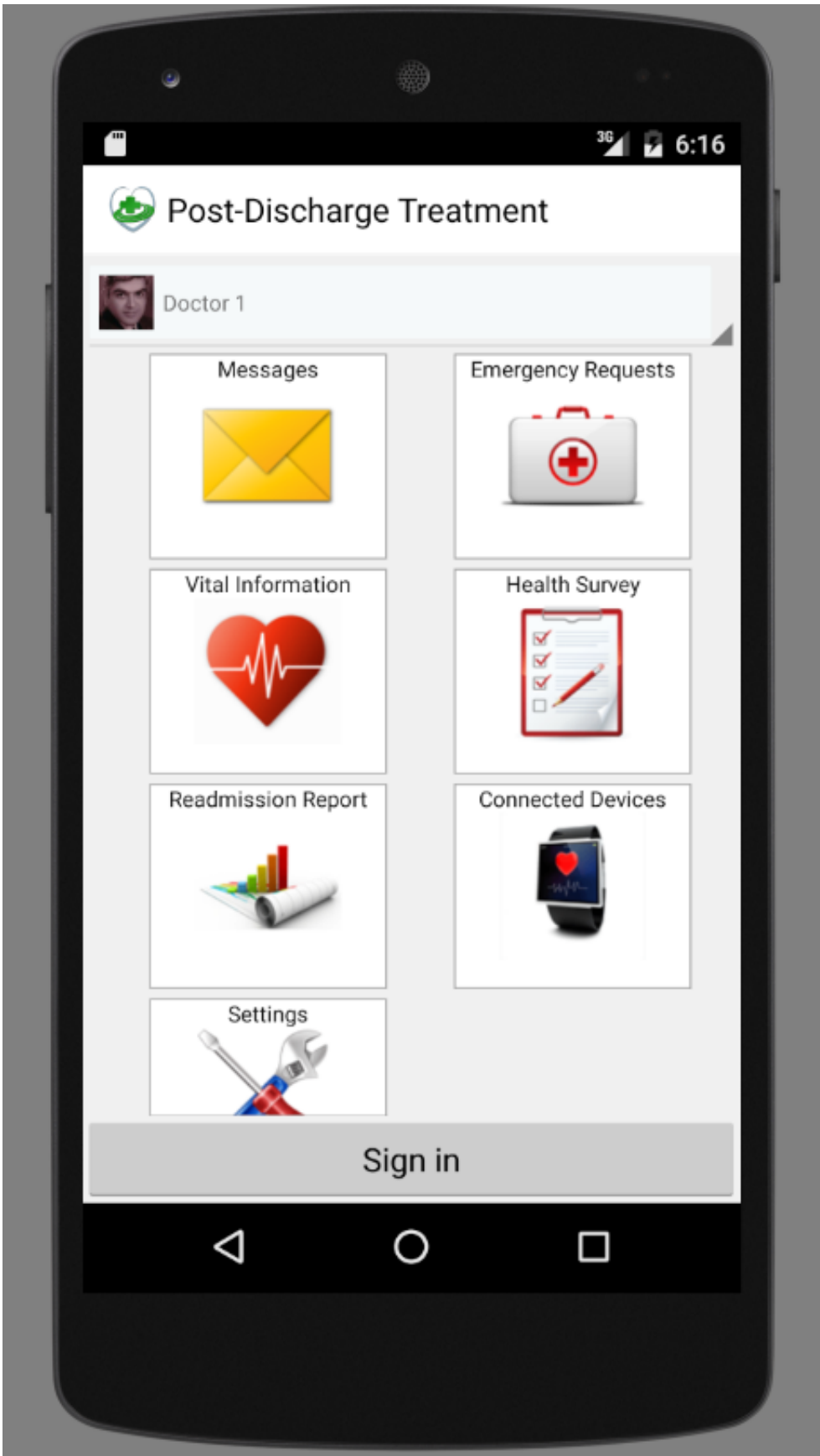


# Hospital readmission app could save healthcare industry billions

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A quartet of Binghamton University graduate students -- Amirhosein Gholami, Qi Jia, Lu He, and Runpei Xu -- combined to create an Android-based mobile application called Post Discharge Treatment and Readmission Predictor. Credit: Amirhosein Gholami

Hospitals and healthcare providers are penalized for readmitting patients within a 30-day time period. An award-winning app developed by graduate students at Binghamton University, State University of New York, could help reduce these readmission rates and save the healthcare industry billions.

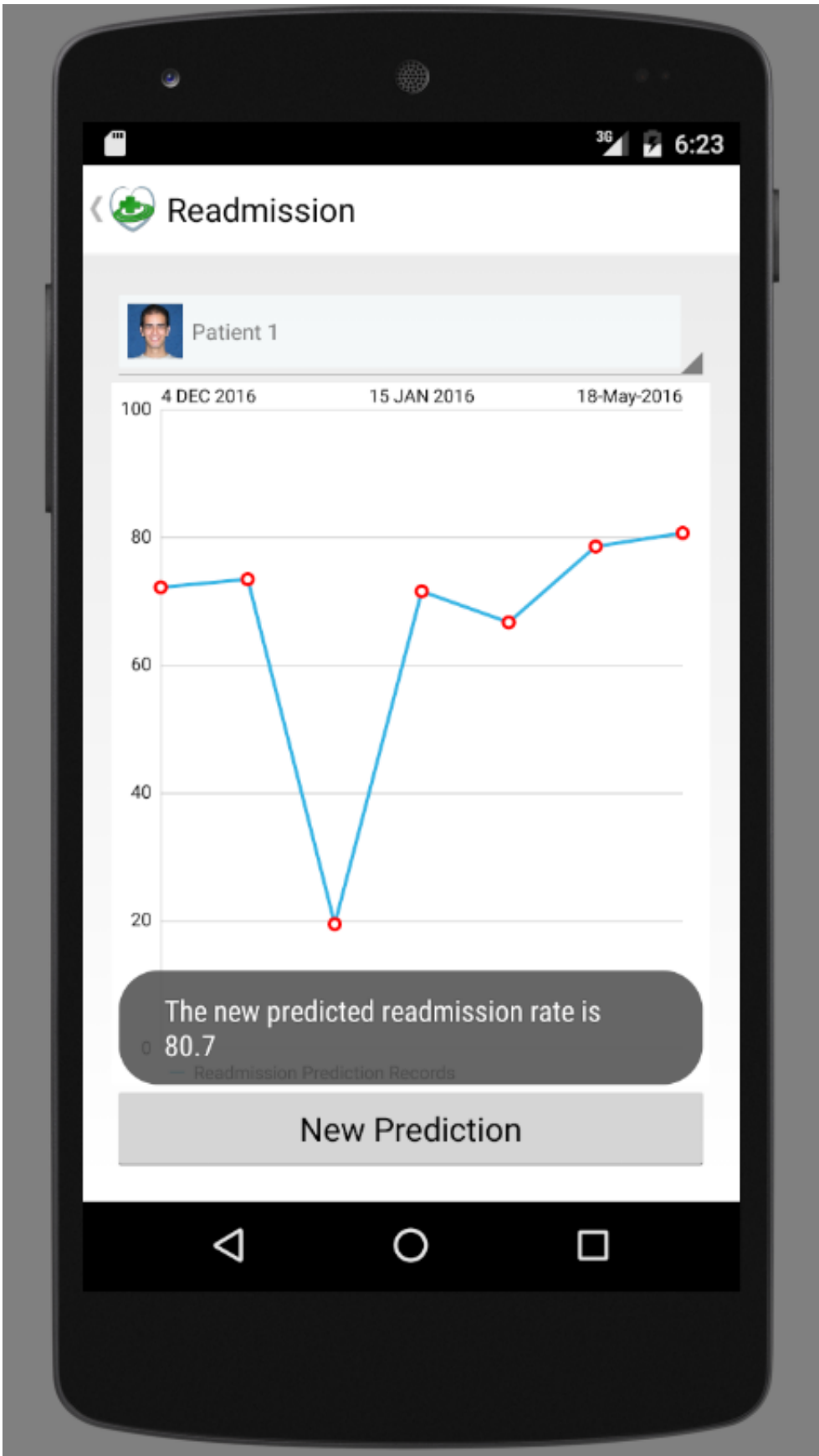
A quartet of Binghamton University graduate students—Amirhosein Gholami, Qi Jia, Lu He, and Runpei Xu—combined to create an Android-based mobile application called Post Discharge Treatment and Readmission Predictor. Students based the app on the research of Chun-An Chou and Sang Won Yoon, assistant professors of systems science and industrial engineering, who have actively been doing research on hospital readmission and how to predict high or low-risk patient when they are discharged from the hospital. The app came in second place in the nationwide 2016 Institute of Industrial and System Engineers CIS Division Mobile App Competition.

"Healthcare providers can benefit from this app," said Gholami. "The benefit for the patient is that they don't have to go to the hospital to wait for some services, or even with emergency services, they don't need to call 911. They can just get help from the [healthcare provider](#). The biggest benefit of this app for hospitals and healthcare providers is to prevent them from paying penalties, which is not a small amount."

With the ubiquity of connected smartphones and tablets, the app creates

a special messaging service between healthcare providers and patients. The app extends the scope of [data mining techniques](#) to the field of healthcare, specifically home treatment. Based on this concept, the readmission risk rate is evaluated based on the data-based assembled prediction model, which increases the prediction accuracy by 20 percent in average comparing to the traditional logistic regression prediction models used in health care.

The app also gives insurance agents opportunities to check patient statuses and warn healthcare providers to take care of high-risk patients. It also has a feature for predicting each patient's readmission probability by comparing the current status of each patient with historical records using different data mining techniques on secured servers.



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"For this app, predicting the readmission rate is only one part. The other part of this app is instant communication between the doctor/nurse and the patient," said Gholami. "The patient can send information directly to the healthcare provider and, based on the new information, the provider can predict the new [readmission](#) rate and send some instructions to the patient to take this medicine, to do this, etc."

The development team is continuing to work to improve the quality and user-friendliness of the current mobile application. Some of the possible future features include improving the accessibility and user-friendliness of the GUI for tablets, adding a medicine scheduler and tracker feature by connecting the application to a home medicine dispenser, and implementing the application for other smartphone platforms (e.g., iOS).

Both Yoon and Gholami think the [app](#) has commercial potential, if that avenue is pursued.

"I don't see anything similar to it on the market," said Gholami. "If it can help to prevent even just 10 percent of [patients](#) from being rehospitalized, it's big money."

A group of the systems science and industrial engineering (SSIE) seniors helped the team develop the current GUI design, based on their usability test.

Provided by Binghamton University

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