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Northern California: Partly to mostly sunny. Highs in the middle and upper 50s, but 30s and 40s in the northern Sierra Nevada. Cooler tomorrow. Weather map, Page C10.

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PETER DASILVA FOR THE NEW YORK TIMES

Nicholas Bryan plays multiple iPhones at a Stanford Mobile Phone Orchestra concert.



PHOTOGRAPHS BY PETER DASILVA FOR THE NEW YORK TIMES

From Pocket to Stage, Music in the Key of iPhone

By CLAIRE CAIN MILLER
and MIGUEL HELFT

PALO ALTO, Calif. — An expectant hush fell over the audience as the director of the chamber ensemble, Ge Wang, came out and asked them to turn off their cellphones. The seven other musicians, dressed in black, filed in and took their positions in a circle.

The conductor raised his hands. A low droning sound arose, as if the chamber ensem-

ble were tuning. Then the musicians began to swing their arms in wide circles, creating rising and falling waves of electronic sound.

The Stanford Mobile Phone Orchestra's performance on Thursday used the most unusual of instruments: Apple iPhones amplified by speakers attached to small fingerless gloves.

Sometimes the sounds were otherworldly. Sometimes, they mimicked raindrops, bird songs or freeway traffic. In one piece, two performers blew into their

phones to stir virtual wind chimes. In another, the instruments took on personalities based on the pitch, volume and frequency of the notes played — as if the musicians were flirting, teasing and admonishing each other.

And gradually, the audience disobeyed instructions, pulling out their own iPhones and iPods to record the performance.

From the earliest days of the iPhone, applications that mimic

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Ge Wang, a co-director of the Stanford Mobile Phone Orchestra, moved around the audience on Thursday, playing two iPhones.

From Pocket to Stage, Music in the Key of iPhone

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musical instruments have topped the download charts. But the Stanford Mobile Phone Orchestra, with its avant-garde compositions and electronic renditions of popular songs like Led Zeppelin's "Stairway to Heaven," is pushing to push the frontiers of the four-decade-old field of computer music.

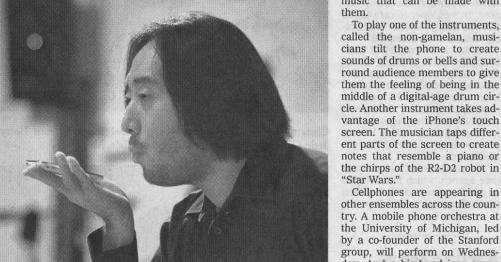
While computer music composers once spent hours programming giant mainframes to synthesize a note, some advances in hardware and software have brought powerful and easy-to-use music tools to personal computers and now, to smartphones.

Ge Wang, the assistant professor who leads the two-year-old Stanford program, says the iPhone may be the first instrument that millions of people will carry in their pockets. "I can't bring my guitar or my piano to the place wherever I go, but I do have my iPhone with me."

Professor Wang said he would like to democratize the process of making music, so that anyone with a cellphone could become a musician. "Part of my philosophy is people are inherently creative," he said. "It's not just people who think they're creative."

To pursue that goal, he co-founded a software company, Smule, which makes applications that turn iPhones into simple musical instruments. Although the consumer apps are less sophisticated than the custom creations of the Stanford orchestra, users have been fascinated by them.

The most popular Smule app, Ocarina, turns the iPhone into a flute-like instrument played by blowing across the microphone, touching virtual finger holes and tilting the phone. Another Smule app mimics a trumpet. The two programs, which cost 99 cents



Ge Wang says the iPhone may be the first musical instrument, electronic or otherwise, that millions will carry in their pockets.

ONLINE: BEHIND THE SCENES

A video looks at the preparation and performance of the Stanford Mobile Phone Orchestra. And on the Bits blog, a reader discusses whether iPhone music is art.

[nytimes.com/technology](#)

Symphony, questions whether iPhone music — which may affect an audience the same way as the vibrations of traditional instruments in a concert hall. "The response of traditional instruments is so subtle to the movement and the sensitivities of the being playing it, so if there can express much, much more by something than something that produces sound electronically," he said.

Professor Wang, who still plays the guitar he learned in middle school, acknowledges that "nothing is better than a cell playing the cello."

Still, he hopes that his ensemble, which builds the instruments, writes the music and performs it — will invent the instruments of the future.

While the Ocarina app is simple enough that anyone can easily play it, the Stanford orchestra is exploring the potential of more complex iPhone instruments and pushing the limits of the type of

music that can be made with them.

To play one of the instruments, called the non-gamelan, musicians tilt the phone to create sounds of drums or bells and surround themselves with them to give them the feeling of being in the middle of a digital-age drum circle. Another instrument takes advantage of the iPhone's touch screen. The musician taps different parts of the screen to create notes that resemble a piano or the strings of the R2-D2 robot in "Star Wars."

Cellphones are appearing in other ensembles across the country. A mobile phone orchestra at the University of Michigan, led by a conductor whose band group will perform on Wednesday. And a big-band jazz group called Large Ensemble used smartphones as instruments during a recent performance in New York.

In the future, Professor Wang said, a music ensemble could be made of any group of people playing together, no matter where they are physically.

Users of Smule's Ocarina software can already listen to other people, anywhere in the world, who are playing at the same time. Professor Wang has invited the San Francisco Symphony to the joint performance, with traditional and iPhone instruments, and he hopes to someday host a concert with musicians and amateurs from across the globe playing their iPhones at once.

"A concert anywhere, anything," he said. "Let's jam."

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front page feature story
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