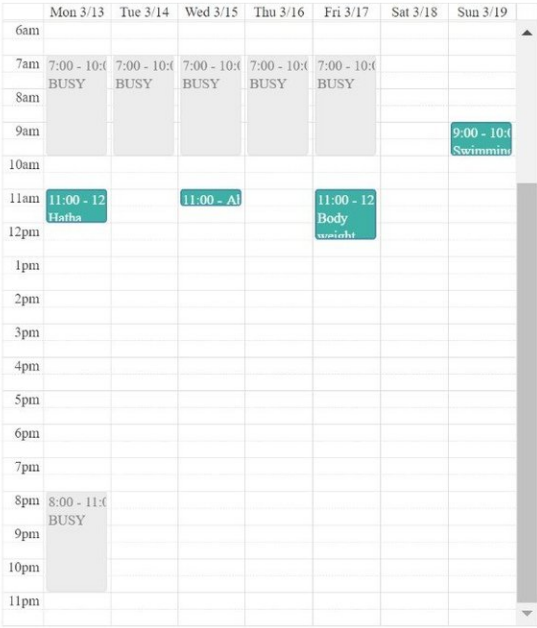
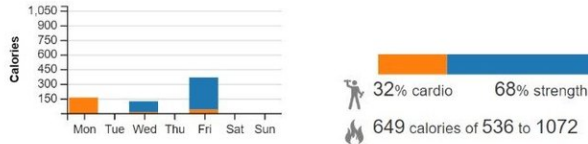


# Researchers develop an app for crowdsourced exercise plans, which rival personal trainers in effectiveness

May 2 2018, by James Urton



**Ray**  
 Female, 29 years, 135 lb  
 Unemployed

**Goals**

**Next Week's Goal**  
 Achieve more active days per week than sedentary

**Long Term Goal**  
 Become comfortable working out on a daily basis

**Constraints**  
 Limited access to workout facilities

**Access to**  
 Yoga mats, small weights, fitness ball.

**Activities**

**Likes**  
 Bodyweight exercises  
 Can be done anywhere with limited resources

**Interested in, but have not tried**  
 Yoga type workouts (strength and flexibility)  
 I am very inflexible and haven't taken the time to learn

**Tried, but did not enjoy**  
 Burpees/Squat Thrusts  
 The motions of this exercise aggravate my acid reflux/heartburn

**Other preferences**  
 Minimal running because I am in awful shape and I live on a giant hill; More focus on abs, glutes, and arms

Screen capture of a portion of a CrowdFit user's profile. Credit: University of Washington

Exercise can prevent chronic disease, boost mental health and elevate quality of life. But exercise can also be an expensive undertaking—especially for newcomers.

A personal trainer costs an average of \$50 per hour, according to WebMD. Alternatives, such as low-cost or free [exercise](#) apps, may yield low-quality workouts that are not adapted to individual preferences or lifestyles—which ultimately dampen their effectiveness.

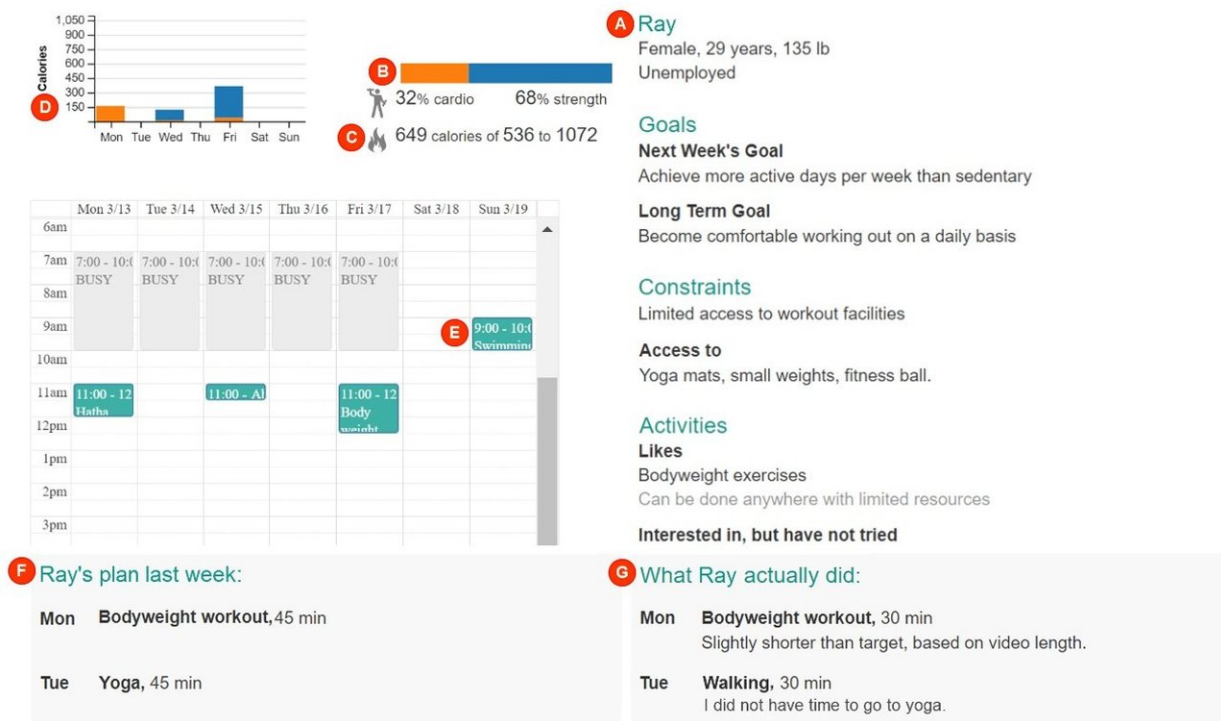
To address these shortcomings, researchers at the University of Washington and Seattle University created CrowdFit, a platform for exercise planning that relies on crowdsourcing from nonexperts to create workout regimens guided by national exercise recommendations and tailored around user schedules and interests.

As the team reported in [a paper](#) presented April 25 at the [2018 CHI Conference on Human Factors in Computing Systems](#) in Montreal, in a field evaluation, nonexperts could create exercise plans as effective as experts under certain conditions. In addition, CrowdFit improved the quality of exercise plans created by nonexperts. Compared to nonexpert [exercise programs](#) prepared via Google Docs, nonexpert plans created using CrowdFit featured more appropriate levels of exercise for each user, a better progression of activities from week to week, more appropriate strengthening routines and better compositions.

"Most apps available to the public offer limited ability to customize an exercise plan—criteria like goals, age and weight," said lead author Elena Agapie, a UW doctoral student in the Department of Human Centered Design and Engineering. "With CrowdFit, we designed greater flexibility to customize exercise plans to a user's schedule, constraints and nuanced preferences."

Through CrowdFit, a person who wants an exercise plan creates a

personal profile on the app, listing information such as daily work schedule, interests and exercise preferences. A nonexpert then uses the profile—as well as exercise and health guidelines provided by CrowdFit—to craft a week-long exercise plan for the user. In the app, the plan is displayed as a detailed schedule, including suggestions for when to exercise, justification for the exercise choices and other information to both encourage the user and help him or her execute the plan correctly. At the end of the week, the user provides feedback, and the planner crafts an updated schedule for the next week.



Screen capture of a portion of a CrowdFit user's profile. Credit: University of Washington

"We previously saw that people can craft plans for others that are challenging and interesting, but also had shortcomings with respect to exercise science," said senior author Sean Munson, a UW assistant professor of human centered design and engineering. "In this study, we set out to test whether supporting planners with information on exercise science and feedback from users could help them produce plans that are also high-quality in this respect."

"By involving nonexperts in the process, there's also an opportunity to increase these nonexperts' exercise knowledge, ultimately benefiting not just the users, but also the planners," said co-author Gary Hsieh, a UW associate professor of human centered design and engineering.

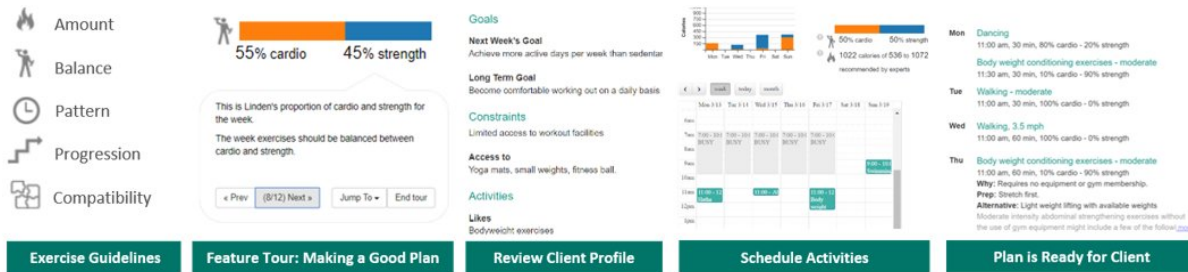
The researchers tested CrowdFit in a study of 46 subjects divided into three groups, each of which received a customized exercise plan based on a CrowdFit profile.

Subjects in the first group received exercise plans crafted by nonexperts—volunteers who lacked the formal education and expertise of a personal trainer—using CrowdFit, which also contains information on exercise guidelines. The second group received exercise plans created by personal trainers, who used Google Docs to view the users' profile information and deliver their plans. The final group received exercise plans crafted by nonexperts, again using profile information and plan delivery via Google Docs. Subjects followed their plans for one to two weeks.

Researchers interviewed the users after they had completed the study, and had exercise scientists evaluate each plan.

Overall, the exercise plans created by nonexperts were as effective as expert-prepared plans based on:

- How well they were tailored to individual needs
- The appropriateness of the intensity and duration of aerobic activity
- The balance between aerobic and muscle-strengthening activities



Screen capture of the planner interface on CrowdFit. Credit: University of Washington

In addition, the CrowdFit plans crafted by nonexperts tended to be as effective as the plans crafted by professional trainers, especially for features such as incorporating basic exercise principles, creating plans that were compatible with user preferences and schedules, and incorporating sufficient aerobic activity. CrowdFit plans also were easier to understand than expert plans and met recommended exercise guidelines.

"Our study has demonstrated that nonexperts can be guided through designing an exercise plan that is consistent with national recommendations," said co-author Molly Welsh, an assistant professor of kinesiology at Seattle University. "There may not yet be a substitute for a trainer prompting a person through a routine on the gym floor, but the role of the expert is expanding to become more collaborative with the

tech industry in guiding future design choices of apps."

The researchers also found areas where CrowdFit performance could be improved, such as including more exercises to improve flexibility and encouraging warm-ups and cool-downs during workouts. Future versions of CrowdFit could incorporate more detailed guidelines for plan creators.

"We hope that tools like this will contribute to a common goal: to increase the adoption of lifelong exercise by all," said Welsh.

**More information:** Paper:  
[eagapie.com/pubs/chi2018\\_exerciseplans.pdf](http://eagapie.com/pubs/chi2018_exerciseplans.pdf)

Provided by University of Washington

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