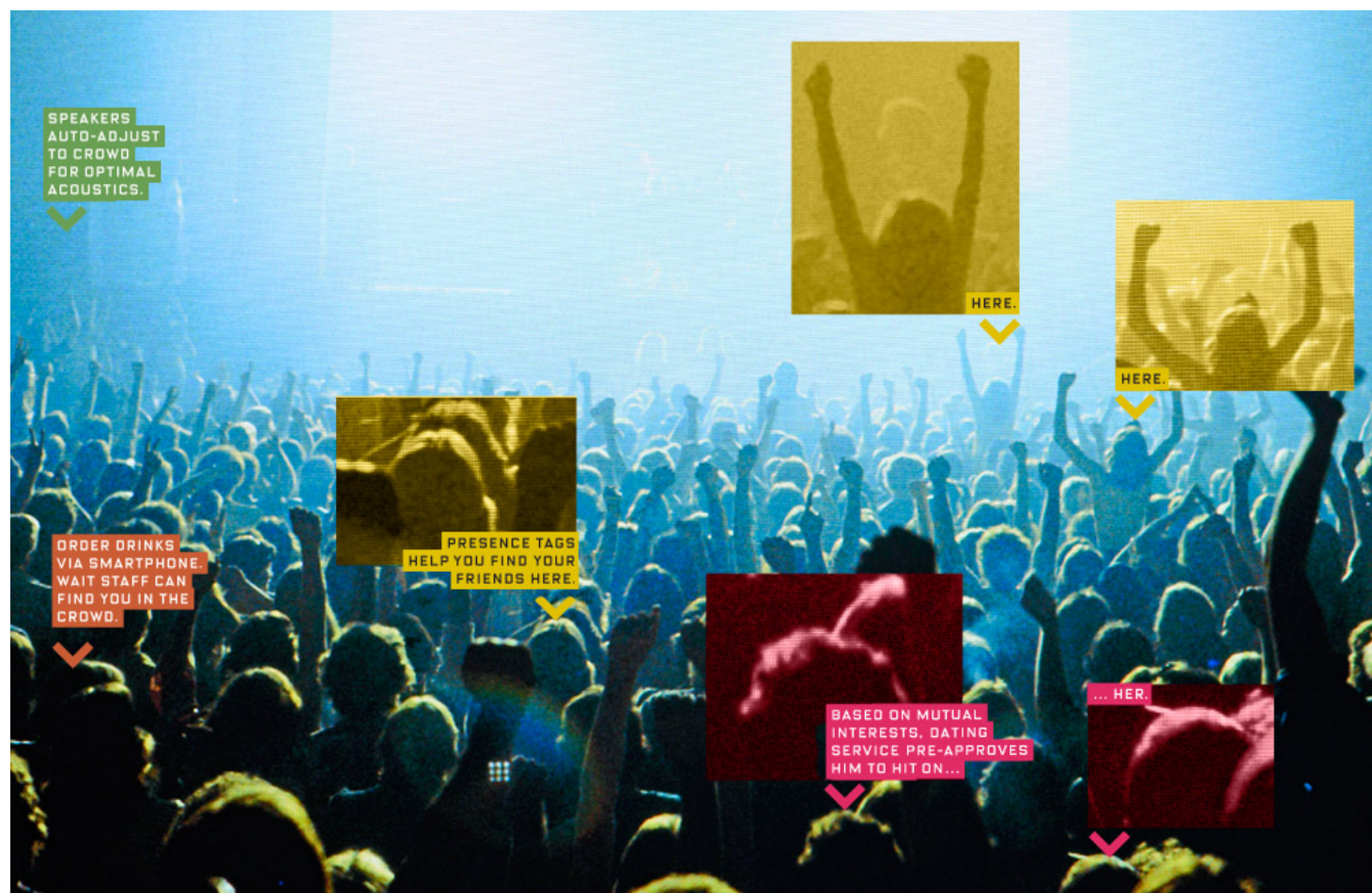# WELCOME TO THE PROGRAMMABLE WORLD

Photographs by Michael Wolf

In our houses, cars, and factories, we're surrounded by tiny, intelligent devices that capture data about how we live and what we do. Now they are beginning to talk to one another. Soon we'll be able to choreograph them to respond to our needs, solve our problems, even save our lives.

On a 5-acre plot in Great Falls, Virginia, less than a mile's stroll through exurban scrub from the wide Potomac River, Alex Hawkinson has breathed life into a lifeless object. He has given his house, a sprawling six-bedroom Tudor, what you might describe as a nervous system: a network linking together the home's very sinews, its walls and ceilings and windows and doors. He has made these parts move, let them coalesce as a bodily whole, by giving them a way to talk among themselves. Open a telnet session in the house's digital hub and you can actually spy on his chattering stuff, hear what it says when no one's listening:

- LIBRARY MOTION SENSOR: Device 0x9E07 zone status 0×0031

- CAR DOOR: Temperature: +13.0C; Battery: 2.4V
- CAR GLOVE COMPARTMENT: [87AC] checkin
- FAMILY ROOM LIGHT: 2001-
- KITCHEN COUNTER LIGHT: 2001-
- THERMOSTAT: 4301-
- FOYER LIGHT: 2001-
- COFFEEPOT: 2001-
- LIVING ROOM MOTION SENSOR: Device 0xB247 zone status 0×0031

This is the language of the future: tiny, intelligent things all around us, coordinating their activities. Coffeepots that talk to alarm clocks. Thermostats that talk to motion sensors. Factory machines that talk to the power grid and to boxes of raw material. A decade after Wi-Fi put all our computers on a wireless network—and half a decade after the smartphone revolution put a series of pocket-size devices on that network—we are seeing the dawn of an era when the most mundane items in our lives can talk wirelessly among themselves, performing tasks on command, giving us data we've never had before.

Imagine a factory where every machine, every room, feeds back information to solve problems on the production line. Imagine a hotel room (like the ones at the Aria in Las Vegas) where the lights, the stereo, and the window shade are not just controlled from a central station but adjust to your preferences before you even walk in. Think of a gym where the machines know your workout as soon as you arrive, or a medical device that can point toward the closest defibrillator when you have a heart attack. Consider a hybrid car—like the new Ford Fusion—that can maximize energy efficiency by drawing down the battery as it nears a charging station.

There are few more appropriate guides to this impending future than Hawkinson, whose DC-based startup, SmartThings, has built what's arguably the most advanced hub to tie connected objects together. At his house, more than 200 objects, from the garage door to the coffeemaker to his daughter's trampoline, are all connected to his SmartThings system. His office can automatically text his wife when he leaves and tell his home A/C system to start powering up.

In this future, the intelligence once locked in our devices now flows into the universe of physical objects. Technologists have struggled to name this emerging phenomenon. Some have called it the Internet of Things or the Internet of Everything or the In-

dustrial Internet—despite the fact that most of these devices aren't actually on the Internet directly but instead communicate through simple wireless protocols. Other observers, paying homage to the stripped-down tech embedded in so many smart devices, are calling it the Sensor Revolution.

But here's a better way to think about what we're building: It's the Programmable World. After all, what's remarkable about this future isn't the sensors, nor is it that all our sensors and objects and devices are linked together. It's the fact that once we get *enough* of these objects onto our networks, they're no longer one-off novelties or data sources but instead become a coherent system, a vast ensemble that can be choreographed, a body that can dance. Really, it's the opposite of an "Internet," a term that even today—in the era of the cloud and the app and the walled garden—connotes a peer-to-peer system in which each node is equally empowered. By contrast, these connected objects will act more like a swarm of drones, a distributed legion of bots, far-flung and sometimes even hidden from view but nevertheless coordinated as if they were a single giant machine.

For the Programmable World to reach its full potential, we need to pass through three stages. The first is simply the act of getting more devices onto the network—more sensors, more processors in everyday objects, more wireless hookups to extract data from the processors that already exist. The second is to make those devices rely on one another, coordinating their actions to carry out simple tasks without any human intervention. The third and final stage, once connected things become ubiquitous, is to understand them as a system to be programmed, a bona fide platform that can run software in much the same manner that a computer or smartphone can. Once we get there, that system will transform the world of everyday objects into a designable environment, a playground for coders and engineers. It will change the whole way we think about the division between the virtual and the physical. This might sound like a scary encroachment of technology, but the Programmable World could actually let us put more of our gadgets *away*, automating activities we normally do by hand and putting intelligence from the cloud into everything we touch.