

## **Supplemental Information**

### ***Vocabulary Test for Potential AMT Participants***

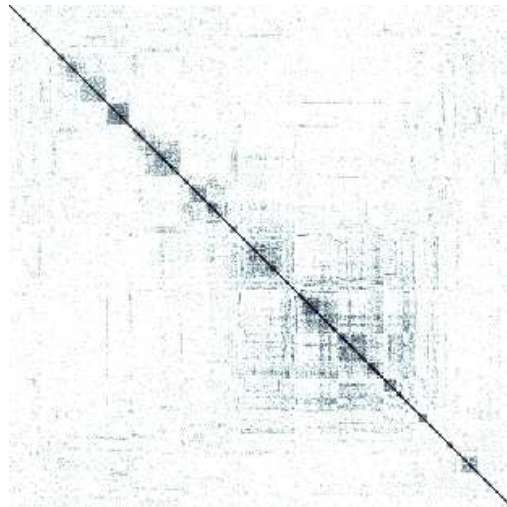
The categories included in the test were: bakery, volcano, highway, kitchen, restaurant, lighthouse, waiting room, forest, closet, sushi bar.

### ***Finding Diagnostic Objects Associated with Functions***

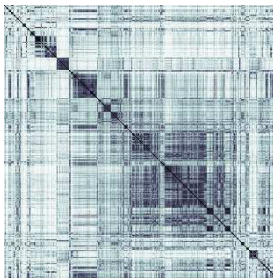
In order to understand the relationship between functions and objects, we performed a norming experiment on AMT. On each trial, participants were provided with a function name (hyperlinked to the ATUS description), and were asked to list the three objects they most associate with that action. Ten individual participants provided responses for each function, and 79 total workers contributed to the experiment. Participants qualified by (1) being based in the US; (2) having at least 2000 previously accepted hits on AMT with at least 98% acceptance and (3) having passed the scene vocabulary task described in the main text. The text responses were corrected for spelling and synonyms were standardized, and we computed the number of unique objects listed for each function. We reasoned that the fewer overall objects listed, the more agreement among individuals and thus the more the function is mapped to particular diagnostic objects.

We split the 227 functions into two groups based on the number of objects listed. We then created two distance vectors based on these spaces and correlated these distances to the human distance vector. We found that the more object-based functions were correlated with the human distance vector at  $r=0.46$  while the other group was correlated at  $r=0.42$ . To determine whether this correlation difference (0.032) is greater than what would be expected by taking random halves of functions, we simulated 10,000 random function splits and measured the correlation difference from these splits. The 95% confidence interval for this distribution was -0.09 to 0.09, indicating that our observed correlation difference of 0.032 was well within what could have been expected from chance alone.

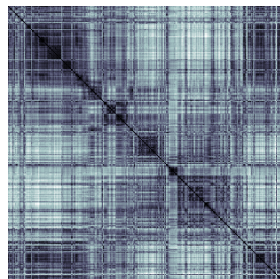
Supplementary Figures



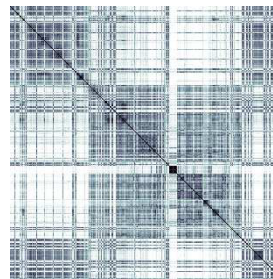
Human Categorization



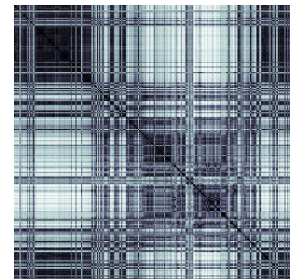
Functions



CNN



Objects



Attributes

**Supplementary Figure 1:** Distance matrices for top-four performing models, with human distance shown above for comparison (identical to Figure 3). All categories have been ordered according to the optimal leaf ordering for the human categorization data.

## List of Functions from American Time Use Survey

- I. Personal care
  - Health related self-care
  - Sexual activity
  - Sleeping
  - Washing/dressing/grooming oneself
  
- II. Household activities
  - Appliance repair & maintenance (self)
  - Building & repairing furniture
  - Cleaning home exterior
  - Email
  - Exercising & playing with animals
  - Exterior home repair & decoration
  - Financial management
  - Food & drink preparation
  - Food presentation
  - Grocery shopping
  - Home heating / cooling
  - Home security
  - Home-schooling children
  - Household organization & planning
  - Interior decoration & repair
  - Interior home cleaning
  - Kitchen & food clean-up
  - Laundry
  - Lawn/garden & plant care
  - Mailing
  - Maintaining home pool/pond/hot tub
  - Non-veterinary pet care
  - Sewing & repairing textiles
  - Storing household items
  - Vehicle repair & maintenance (self)
  
- III. Caring for & helping household members
  - Arts & crafts with children
  - Attending child's events
  - Helping adult
  - Helping child with homework
  - Looking after adult
  - Looking after children
  - Obtaining medical care for adult
  - Obtaining medical care for child

- Organizing & planning for adults
- Organizing & planning for children
- Physical care of adult
- Physical care of children
- Picking up / dropping off adult
- Picking up / dropping off child
- Playing sports with children
- Playing with children (not sports)
- Providing medical care to adult
- Providing medical care to child
- Reading with children
- Talking with children

IV. Work & work-related activities

- Architecture & engineering work
- Arts / Design / Entertainment / Sports / Media work
- Building and Grounds Cleaning and Maintenance work
- Business and Financial Operations work
- Community and social work
- Computer and mathematical work
- Construction and Extraction work
- Education and library work
- Farming / Fishing and Forestry work
- Food Preparation and Serving work
- Healthcare work
- Income-generating hobbies & crafts
- Income-generating performance
- Income-generating rental property activity
- Income-generating selling activities
- Income-generating services
- Installation / Maintenance and Repair work
- Job interviewing
- Job search activities
- Legal work
- Management/Executive work
- Military work
- Office and Administrative work
- Personal Care and Service work
- Production work
- Protective services work
- Sales work
- Science work
- Transportation and Material Moving work
- Work-related eating/drinking
- Work-related social activities
- Work-related sports

- V. Education
  - Attending school-related meetings & conferences
  - Education-related administrative activities
  - Extracurricular club activities
  - Homework
  - School music activities
  - Student government
  - Taking class for degree or certification
  - Taking class for personal interest
  
- VI. Consumer purchases
  - Comparison shopping
  - Purchasing food (not groceries)
  - Purchasing gasoline
  - Shopping (except food and gas)
  
- VII. Professional & personal care services
  - Banking
  - Buying & selling real estate
  - Out-of-home medical services
  - Using clothing repair & cleaning services
  - Using legal services
  - Using meal preparation services
  - Using other financial services
  - Using personal care services
  - Using professional photography services
  - Using vehicle maintenance & repair services
  - Using veterinary services
  
- VIII. Household services
  - Using home repair & construction services
  - Using in-home medical services
  - Using interior home cleaning services
  - Using lawn & garden services
  - Using paid childcare services
  - Using pet services
  
- IX. Government services & civic obligations
  - Civic obligations
  - Obtaining licenses & paying fees
  - Security screening
  - Using police & fire services
  - Using social services
  - Waiting

- X. Eating & drinking
  - Eating & drinking
  
- XI. Socializing, relaxing & leisure
  - Arts & crafts
  - Attending meetings for personal interest
  - Attending movies
  - Attending museums
  - Attending or hosting parties
  - Attending the performing arts
  - Collecting as a hobby
  - Computer use (not games)
  - Dancing
  - Gambling
  - Hobbies
  - Listening to music (not radio)
  - Listening to radio
  - Playing games
  - Reading for personal interest
  - Relaxing
  - Socializing
  - Tobacco use
  - Watching television & movies
  - Writing for personal interest
  
- XII. Sports, exercise & recreation
  - Biking
  - Boating
  - Bowling
  - Camping
  - Doing aerobics
  - Doing gymnastics
  - Doing martial arts
  - Fencing
  - Fishing
  - Golfing
  - Hiking
  - Hunting
  - Participating in aquatic sports
  - Participating in equestrian sports
  - Participating in rodeo
  - Playing baseball
  - Playing basketball
  - Playing billiards
  - Playing football
  - Playing hockey

Playing racquet sports  
Playing rugby  
Playing soccer  
Playing softball  
Playing volleyball  
Rock climbing / caving  
Rollerblading / skateboarding  
Running  
Skiing / ice skating / snowboarding  
Using cardiovascular equipment  
Vehicle racing/touring  
Walking  
Watching aerobics  
Watching aquatic sports  
Watching biking  
Watching billiards  
Watching boating  
Watching bowling  
Watching dance  
Watching equestrian sports  
Watching fencing  
Watching fishing  
Watching golf  
Watching gymnastics  
Watching hockey  
Watching live baseball  
Watching live basketball  
Watching live football  
Watching live soccer  
Watching live softball  
Watching live vehicle racing  
Watching martial arts  
Watching people walk  
Watching racquet sports  
Watching rock climbing / caving  
Watching rodeo  
Watching rollerblading / skateboarding  
Watching rugby  
Watching running  
Watching skiing / snowboarding  
Watching volleyball  
Watching weightlifting  
Watching wrestling  
Weightlifting  
Working out  
Wrestling

Yoga

XIII. Religious & spiritual activities

Attending religious services

Religious education

Religious practices

XIV. Volunteer activities

Volunteer at event

Volunteer work: attending meeting

Volunteer work: blood donation

Volunteer work: building

Volunteer work: clean up

Volunteer work: collecting goods

Volunteer work: computer use

Volunteer work: food preparation

Volunteer work: fundraising

Volunteer work: organizing

Volunteer work: performing

Volunteer work: providing care

Volunteer work: public safety

Volunteer work: reading

Volunteer work: teaching

Volunteer work: telephone calls

Volunteer work: writing

XV. Telephone calls

Telephone calls

XVI. Traveling

In transit / traveling

Travel

**List of Functions from SUN Attribute Database**

Sailing/boating

Driving

Biking

Transporting things or people

Sunbathing

Vacationing / touring

Hiking

Climbing

Camping

Reading

Studying / learning

Teaching / training



Research  
Diving  
Swimming  
Bathing  
Eating  
Cleaning  
Socializing  
Congregating  
Waiting in line / queuing  
Competing  
Sports  
Exercise  
Playing  
Gaming  
Spectating / being in an audience  
Farming  
Constructing / building  
Shopping  
Medical activity  
Working  
Using tools  
Digging  
Conducting business  
Praying