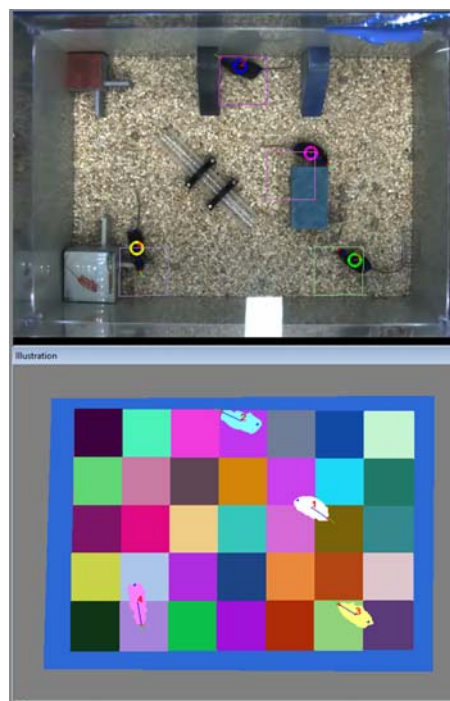Radio Frequency Identification (RFID) systems use radio frequency to identify, locate and track people, assets and animals. RFID-assist has been successfully added to Clever Sys Behavior Recognition products to enhance our lab animal behavior analysis system functionality, performance, and reliability. RFID-Assisted SocialScan is first such application.

SocialScan is a member of our *SocialScan Suite* that quantitatively and qualitatively measures social behaviors of two or more animals that are enclosed in a single arena, whether it is a simple home cage or a complex arena. SocialScan captures and tracks these animals (rodents) in an arena, and automatically determines various social interactions among them.

Using implanted RFID tags in the animal and a platform consisting of an array of RFID detectors placed under the device (cage or arena), the system utilizes radio frequency to localize the tags implanted into animals, thereby constantly monitoring the position of each animal. Simultaneously, video analysis tracks the entire body, position, and many other features of each animal. Combining information obtained from both of these channels, the SocialScan system is able to track the animals extremely reliably over extended periods of time! Pure video-based analysis that requires distinguishable marks on the animals is unable to scale beyond 2 or 3 animals. However, with the advent of RFID-assisted video analysis, we are able to track many more animals with accurate IDs. This is a landmark innovation that Clever Sys is proud to offer going forward.

SocialScan has several unique and important features in analyzing social behaviors among animals. First, the system can differentiate multiple animals without artificially coloring (labeling) them, as long as they have some perceivable difference in terms of natural color or size. The system will automatically determine who is who, even after two animals get together and then separate. The system can automatically differentiate two animals even when they are in contact, an extremely important feature to have.

The RFID-assist further enhances this capability. If visible marking is insufficient or impractical, or if you simply need more accuracy, you have the option now of using RFID-Assisted SocialScan to successfully resolve any issues with tracking IDs.

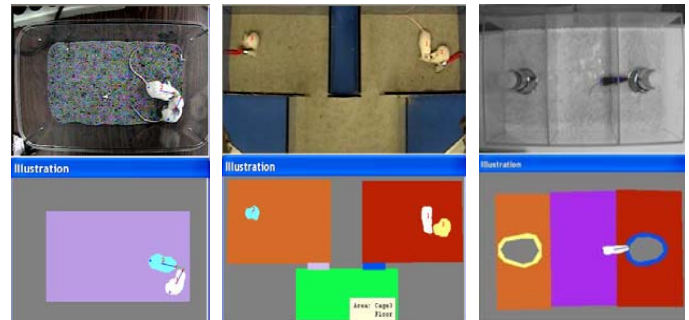**RFID-Assisted Social Group Activity Monitoring**

RFID-Assisted SocialScan

SocialScan system can automatically determine if animals are in contact with each other, if any two animals are approaching each other, leaving (avoiding) each other, one is following the other, or simply, or if one is sniffing at the other's head, mid-body or genital area. More advanced events have been recently added, including Staring, Active Contact or Passive Contact, specific body-part to body-part contact, and Mount. Dynamically updated Social Distance between pairs of animals (e.g., how many times does Animal A get to within 10 cm of Animal B) are also available.

Second, the system can automatically identify the head and tail of each of animal; therefore there is no need to artificially color their head and tail parts. The system will determine the social interactions of approach, avoidance, sniffing, and contact based on the automatically detected heads and tails of animals, and their relative spatial positions and movements.

Third, the techniques for automation of the categorization and quantification of social interactions between animals have been applied to achieve high throughput screening. System architecture has been optimized for high throughput screening . The Realtime Option is necessary to perform realtime analysis where the live video feed into the computer is compressed, encoded, saved to the hard drive while simultaneously full analysis of the video is performed.

Contact us to learn more or to schedule a demo of this latest innovation from Clever Sys.

Social Application Examples

Home Cage on RFID Platform and tag

Unique Capabilities

- **New for 2016: Multi-animal tracking w/ RFID-assist**
- **Unmatched animal ID accuracy**
- **Synergy of RFID tracking and video analysis**
- **Complete Social Behavior Analysis system**
- **High-Throughput & Real-Time capability**
- **Continuous long-term recording and analysis**
- **No user intervention required during experiment**
- **Detailed statistics about occurring events**
- **Automated Binned Data Output, Graphs, Charts**
- **Batch-mode, Result review & Visualization**

Applications

- **Social Interaction Test**
- **Social Recognition Test**
- **Social Preference Test**
- **Resident Intruder Test**
- **Group-housed Social Activity Test**
- **And many more**

Product Codes	
Product Name	**Code**
SocialScan	CSI-SW-SCS
GroupHousedScan	CSI-SW-GHS
RFID-Assist Cage Platform	CSI-RFID-PLTCG
RFID-Assist Special Arena Platform	CSI-RFID-PLTAR

Behaviors RFID-Assisted SocialScan can detect:

- **Contact**
- **Active Contact**
- **Passive Contact**
- **Huddle**
- **Contact by Body Parts**
- **Approach**
- **Leave**
- **Follow**
- **Sniff at Nose**
- **Sniff at Body**
- **Sniff at Genital**
- **Social Distance**
- **Body-part Dist**
- **Stare**
- **Mount**
- **Compete**

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